# The Donor-Intermediary Interaction and the Decision-Making Process of Intermediaries for Development Assistance for Health

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# The Donor-Intermediary Interaction and the Decision-Making Process of Intermediaries for Development Assistance for Health

Katharina M. K. Stepping

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# *List of Acronyms and Abbreviations*

| | |
|---|---|
| AfDB | African Development Bank |
| AIDS | Acquired Immune Deficiency Syndrome |
| APSA | American Political Science Association |
| cdf | cumulative distribution function |
| CEPII | Centre d'Etudes Prospectives et d'Informations Internationales (*Center for Prospective Studies and International Information*) |
| CHE | Switzerland |
| CIA | Central Intelligence Agency |
| CPI | Corruption Perception Index |
| CPIA | Country Policy and Institutional Assessment score |
| DAC | Development Assistance Committee |
| DAH | Development Assistance for Health |
| DZI | Deutsches Institut für Sozialfragen (*German Central Institute for Social Questions*) |
| EC | European Commission |
| GAVI | Global Alliance for Vaccines and Immunization |
| GDP | Gross Domestic Product |
| GIZ | Deutsche Gesellschaft für Internationale Zusammenarbeit (*German Agency for International Cooperation*) |
| GNI | Gross National Income |
| HDI | Human Development Index |
| HIV | Human Immunodeficiency Virus (HI-Virus) |
| IBRD | International Bank for Reconstruction and Development |
| IFC | International Finance Corporation |
| IHME | Institute for Health Metrics and Evaluation |
| LUX | Luxembourg |
| MCC | Millennium Challenge Corporation |
| MDG | Millennium Development Goals |
| NGO | Non-Governmental Organization |
| NL | Netherlands |
| ODA | Official Development Assistance |
| OECD | Organization for Economic Cooperation and Development |
| OLS | Ordinary Least Squares |
| PEPFAR | The U.S. President's Emergency Plan for AIDS Relief |
| PQLI | Physical Quality of Life Index |

| | |
|---|---|
| UK | United Kingdom |
| UN | United Nations |
| UNAIDS | Joint United Nations Programme on HIV/AIDS |
| UNDP | United Nations Development Programme |
| UNFPA | United Nations Population Fund |
| UNHCR | United Nations High Commissioner for Refugees |
| UNICEF | United Nations Children's Fund |
| UNU-WIDER | United Nations University - World Institute for Development Economics Research |
| US | United States |
| WB | World Bank (The World Bank Group) |
| WGI | Worldwide Governance Indicators |
| WHO | World Health Organization |

# PART I Introduction

# Chapter 1
# Introduction

## 1.1. Overview

In September 2000, the international community set out the United Nations' Millennium Development Goals (MDGs), with the principle target to halve global poverty until 2015. The reduction of child mortality, the improvement of maternal health and the fight of HIV/Aids, malaria and other diseases were declared major objectives on the international agenda established by 189 nations. Compared to previous efforts, these objectives are more comprehensive, more concise and more specific as to a deadline. Health has emerged as an important issue on the international agenda, partly reflected in the volume of health-related assistance which quadrupled over two decades to $21.8 billion in 2007 (IHME (2009)). Unprecedented amounts have been made available for both foreign aid and health-related assistance, partly motivated by the rise of the HIV/Aids epidemic in sub-Saharan Africa. The share of aid for the social sector rose from about 20 percent at the beginning of the 1990s, to about 35 percent in the mid-2000s, including higher spending on health (Thiele et al. (2007), 600). Resources were devoted to new objectives such as stemming pandemics in the developing world (Adelman (2003), 9). The traditional government-to-government structure of development assistance has been remodeled through the emergence of new organizations such as private foundations and global health partnerships (Hein and Kickbusch (2010), 2). It seems that more attention has been paid to health circumstances in developing countries in terms of foreign aid resources.

In the aid literature, there is a growing consensus that development needs and donor interests need to be taken into consideration in order to understand the donor decisions on aid allocation. Political, strategic, economic and humanitarian motives are widely accepted as important motives and as a reasonable basis for explaining aid allocation patterns across donors. Donors tend to embrace these motives in policy statements and, therefore, it is generally assumed that donors use these characteristics as reference when allocating aid among countries (McGillivray and White (1993), 2-3). Ultimately, statements and decisions on amount, country selection and use are interpreted as indicators for the broader objectives of donor governments (Lancaster (2007), 13).[1] The evidence on aid allocation suggests that many determinants are important and that motives vary across aid intermediaries and over time. However, the process of selection and aid allocation is often assumed, more implicitly than explicitly, to be related to the needs of the intended beneficiaries. In addition, the common rhetoric of the needy beneficiaries with precarious health conditions, often portrayed as poor, female and vulnerable, suggests a clear focus on health priorities in the selection process of potential

[1] Some countries, such as Germany, might not decide about each of these points on an annual basis. The budgetary decision for partner countries as well as the identification of priorities is usually done every three years. Despite the longer time horizon for some aspects, the general idea remains the same: the government has to decide on it.

receiving countries. Organizations usually state publicly what official objectives they want to achieve, but the selection and budgeting rules are often arbitrary and hidden.

Each year billions of dollars are transferred from developed countries to developing countries, designated as foreign aid. In the literature, the resource transfer of financial or in-kind resources is usually presented as a linear aid chain that links a donor government to the government in a recipient country. In fact, the transfer of development assistance for health is the visible result of decisions made by donors and aid intermediaries. The latter have become increasingly important for foreign aid as the connecting links between donors and recipients. The heterogeneous group of aid intermediaries for health assistance is comprised of bilateral aid agencies, multilateral organizations, private foundations, public-private partnerships and international non-governmental organizations (NGOs).

The MDGs have been described as "a major motivational device to increase development efforts in and on behalf of poor countries" (Easterly (2009b), 26). The United Nations' Millennium Development Goals present the international development agenda for, at least, traditional Western donors containing three specific health objectives: the reduction of child mortality, the improvement of maternal health and the fight of HIV/Aids and other diseases. Policy statements and verbal commitments of many intermediaries have emphasized the importance of global health problems. Health assistance has been assumed to be systematically different from other foreign aid because, first, the provision of global public health supposedly represents a different end purpose and, second, the strategic orientation presumably is global rather than country-focused (Lancaster (2007), 16). This analysis focuses on the decision-making process of aid intermediaries for development assistance for health (DAH). The principal question is in how far the knowledge about poor health circumstances in a potential recipient country influences the decisions taken as regards health assistance. To our knowledge, the empirical analysis of this study is the first attempt to assess the importance of health indicators for the decision to select a recipient, and for the decision to allocate health assistance to a selected recipient. In the context of health assistance, no prior evidence on the driving forces neither for the selection stage nor the allocation stage is available. The distinction between the driving forces of the selection decision and the allocation decision is necessary because it allows the separate analysis of the two decisive steps in the decision-making process. Phrased differently, and from an econometric point of view, if only the second stage, the allocation decision, is analyzed, it is implicitly assumed that the determinants of both stages are the same. The little available evidence for foreign aid on the differences between selection and allocation, however, suggests the driving forces to be different.

New Institutional Economics serves as theoretical framework, in which the analyses of the donor-intermediary interaction and the decision-making process of intermediaries for health assistance are embedded. This body of thought uses several analytical instruments which change key assumptions of neoclassical theory.[2] The most important ones for our analysis are the concepts of individual

[2] The following paragraph is based on Furubotn and Richter (2005), 1-14, and Richter (1994), 1-5.

rationality, transaction costs, the maximand and the methodological individualism. According to the concept of individual rationality, individuals are assumed to be boundedly rational, in the sense that they are intendedly rational, but limitedly so due to transaction costs. Second, transaction costs are assumed to be positive and are defined as "search and information costs, bargaining and decision costs, policing and enforcement costs", which are condensed to "resource losses incurred due to imperfect information" (Dahlman (1979), 148). According to the concept of the maximand, individuals are assumed to pursue their own interests and to maximize utility subject to constraints, determined by the institutional structure. Fourth, organizations or collectivity are assumed to be constructed by individual agents and, hence, organizations are not understood as if they were individuals themselves. Summarizing, in this theoretical framework, the boundedly rational individual decision-maker maximizes utility subject to constraints established by the institutional setting in a world of positive transaction costs.

## 1.2. Structure

After the introduction, the second part of the thesis establishes the theoretical basis for the subsequent analyses. The *second chapter* delineates the organizational environment of health assistance, since the traditional government-to-government relationship has long been complemented by a multitude of other players. The game-theoretical model abstracts from the many diverse relationships between possible donors and possible intermediaries and, hence, uses the same theoretical framework for analyzing the donor-intermediary interaction. Therefore, the decision-making process of donor and aid intermediary is modeled in three sequential games with two players. The games analyze the asymmetric information structure of their relationship, the motives and incentives of both players and which role reputation plays in their interaction.

An overview of the relevant literature on the decision-making process of foreign aid is provided in *chapter three*. After a review of the few empirical analyses with an explicit distinction between the selection stage and the allocation stage, influential studies and recent empirical studies on aid allocation are presented, focusing on aggregate and disaggregate cross-country analyses of bilateral donors with panel data.[3]

*Chapter four* provides the theoretical background on the driving factors of selection and allocation decisions for bilateral donors. Several hypotheses on the importance of recipient characteristics, donor characteristics and the relationship between donor and recipient characteristics are developed. Poor health indicators, the quality of the institutional environment, the national efforts for the health system,

[3] In the remainder, bilateral aid agencies are referred to as bilateral donors for two reasons. One, it follows the tradition of the foreign aid literature and facilitates comparisons of the empirical results to previous studies on foreign aid. Two, it is difficult to disentangle the national government as donor and the bilateral aid agency as intermediary; at least in cross-country analyses.

rivalry among donors, the programmatic preferences of a donor and the bilateral relations can influence the decision-making process of bilateral donors.

In the third part, the data and the methodology are described. *Chapter five* provides the technical details on the dataset and presents stylized facts about the data used for the empirical analyses. The first part summarizes the selection decisions of the average bilateral donor as well as the selection decisions of major, like-minded and small donors.[4] In the second part, the allocation behavior of the average donor is illustrated as well as the decision-making process of the major and like-minded donors.

In *chapter six*, the modeling of the decision-making process is commented on from an econometric point of view. The standard Tobit model, the type II Tobit model and the two-part model as the estimation techniques for limited dependent variables most often used in aid allocation studies are presented. Two useful extensions of the two-part model are also commented on. The implications of each approach are explained for both the selection and the allocation stage. The chapter closes with some remarks on the adequacy of using random effects respectively fixed effects in our context.

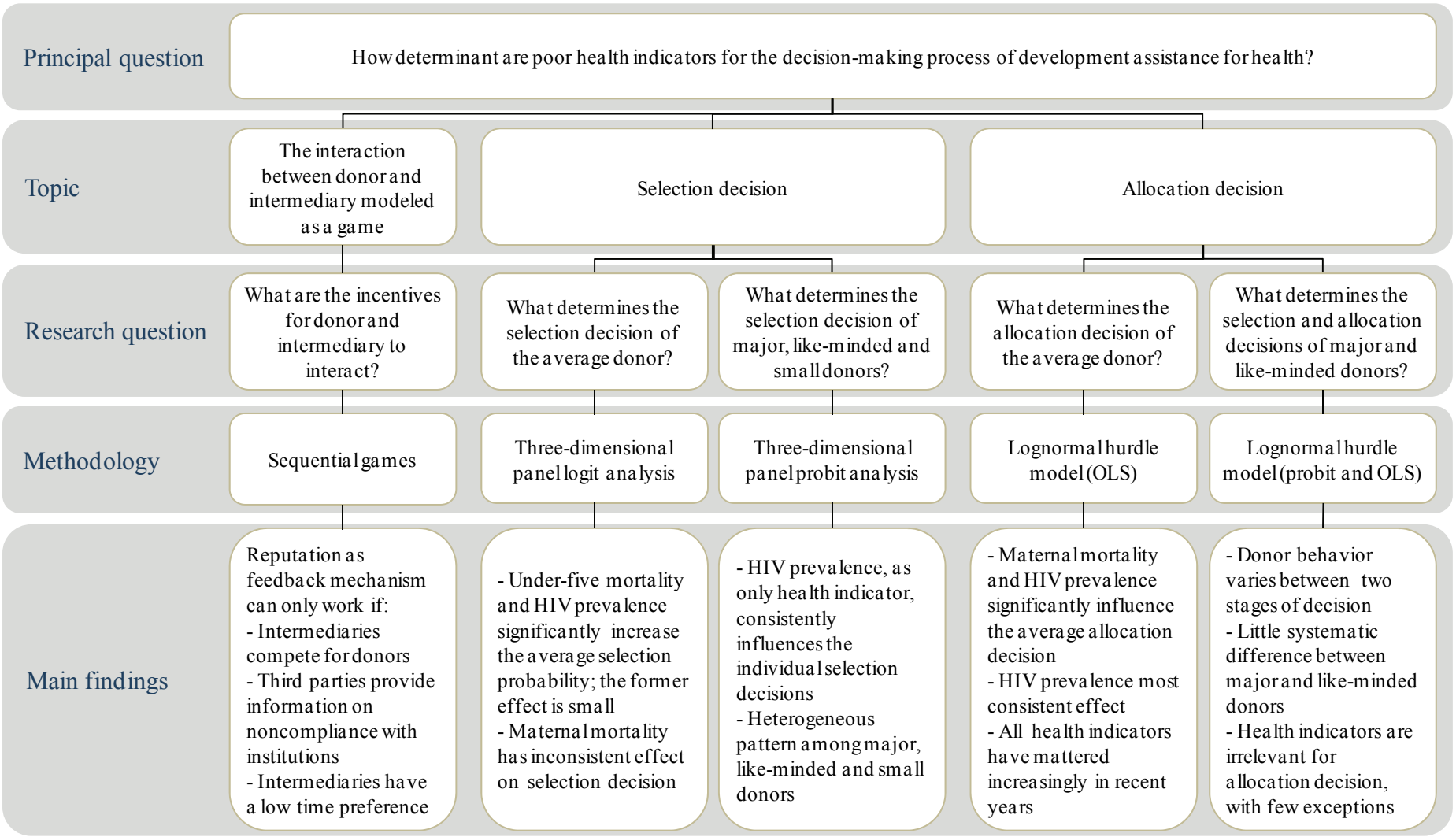
The fourth part presents the empirical analyses. *Chapter seven* is guided by the question of why some countries are selected as health assistance recipients and others are not. First, a three-dimensional panel logit analysis is used to identify the determinants of the country selection decision taken by the average bilateral donor. Second, a three-dimensional panel probit analysis analyzes the questions whether any systematic differences in the selection decisions of the 22 traditional OECD donors can be found and whether any selection pattern across donor groups can be observed.

*Chapter eight* finally answers the question of why some countries actually receive much foreign assistance for health while others receive little. First, the importance of poor health for allocation decisions on health assistance by the average bilateral donor is questioned, employing the second part of a lognormal hurdle model. Second, the selection and allocation behavior of the most important traditional Western donors is analyzed. The lognormal hurdle model allows estimating first the selection decisions with probit and then the allocation decision with ordinary least squares.

The last part presents the conclusions. *Chapter nine* starts with summarizing the topic and commenting on the relevance of the study. Then, the main conclusions of the analysis of the donor-intermediary interaction are presented, as well as of the country selection and aid allocation decisions. The chapter concludes with some comments on the limitations of the analysis as well as some last remarks.

[4] The major donors are France, Germany, Japan, Spain, the UK and the US. Like-minded donors are Canada, Denmark, the Netherlands, Norway and Sweden. Small donors are Austria, Australia, Belgium, Finland, Greece, Ireland, Italy, Luxembourg, New Zealand, Portugal and Switzerland. Please refer to chapter 7.3 for the definition of each donor group.

Figure 1. Overview of research questions



# PART II Theoretical foundation

# Chapter 2
# The interaction between donor and intermediary modeled as a game

## 2.1. Introductory remarks

Development assistance for health has emerged as an important branch of foreign aid and has reshaped the organizational landscape over the past two decades. First, unprecedented amounts of funding have been made available for both foreign aid and health-related assistance, partly motivated by the rise of the HIV/Aids epidemic in sub-Saharan Africa.[5] Total development assistance for health has quadrupled from 1990 to 2007, from $5.6 billion to $21.8 billion (IHME (2009)). Second, private philanthropy and public-private partnerships for global health have emerged as new players during the first decade of the new millennium. For example, philanthropy amounted to $49.1 billion in 2007 (Adelman (2009), 27). Large-scale contributions by many affluent individuals helped to establish new private foundations. Such financial contributions are small compared to government funds for foreign aid, but large compared to the donations by the average donor (Bishop and Green (2009), 12). This has led to significant changes in the composition of development assistance for health. In the 2000s, bilateral and multilateral aid agencies are still the most prominent aid intermediaries, but the importance of NGOs, global health partnerships and private foundations increased considerably. In particular, the absolute changes are significant because of the larger volume of development assistance for health (IHME (2009); Lucas (2004), 290-291). Third, the global health movement has become an important driving force for aid, with a powerful voice for prioritizing health. The predominance of health concerns within the eight Millennium Development Goals is only one example. Forth, celebrities increasingly use their popularity to advocate international assistance. A well-known example is the musician Bono, who used beneficial concerts and other charitable activities to promote the idea of fighting poverty by a substantial debt relief for poor countries (West (2008), 77; also Bishop and Green (2009), 205).

Against the background of the many significant changes in the area of health assistance, the predominant picture of the government-to-government relationship seems too simplistic. In fact, many actors involved in the aid system have been recognized as playing a strategic role in a series of linked action situations, and as being connected to each other (Gibson et al. (2005), 63). In our context, the

[5] Roughly speaking, between 1990 and 2008, sub-Saharan Africa received two thirds of total official development assistance from bilateral donors and one third from multilateral agencies. In 1990, bilateral donors provided approximately $12 billion and multilaterals $7 billion. In 2008, bilateral donors provided approximately $30 billion and multilaterals $15 billion, after a peak of $50 billion and $13 billion, respectively, in 2007. Health-related development assistance varied considerably between 1995 and 2008 (for which years data is available). Recently, figures include information on NGOs, public-private partnerships and multilateral organizations as regards health assistance what allows a better idea of their importance for that sector. (OECD (2011))

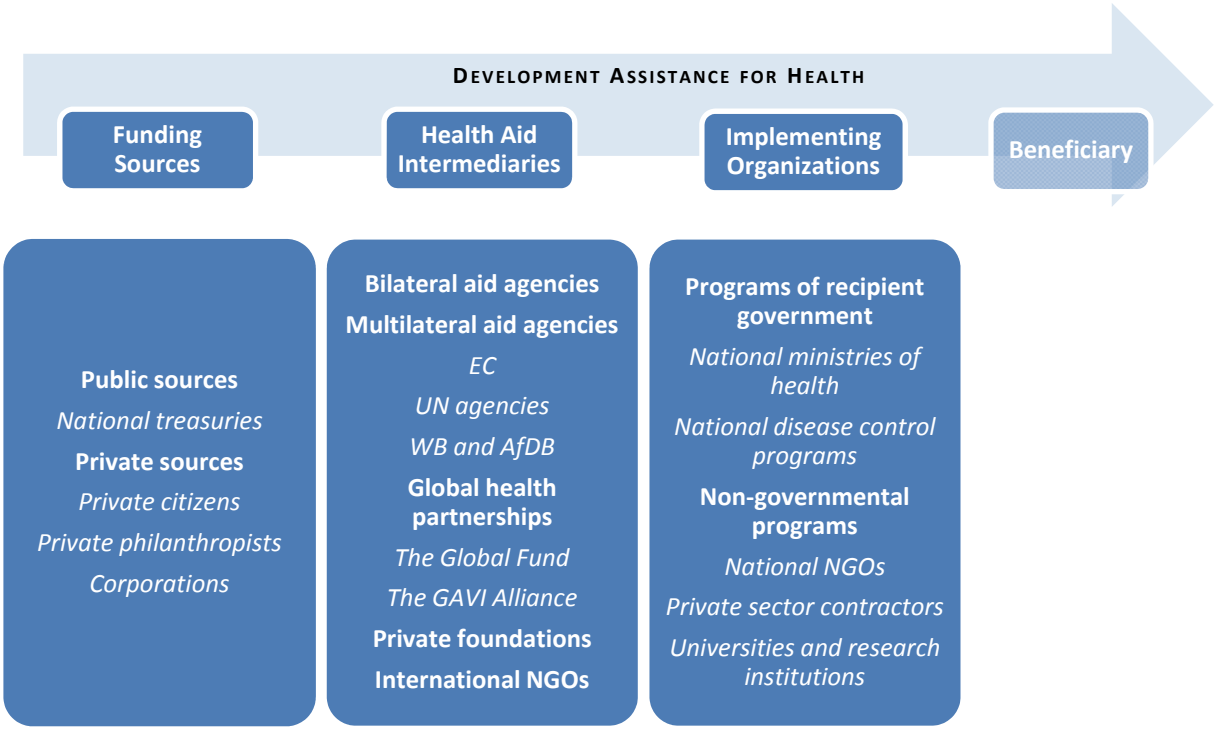
relevant actors are public and private donors. Aid intermediaries are bilateral aid agencies, multilateral organizations, private foundations, public-private partnerships and international NGOs. Donations comprise resources from public donors, individuals, private foundations and corporate entities. The allocation decision, as the visible part of the decision-making process for foreign aid, is modeled in three sequential games with two players, a donor and an intermediary. The focus on the donor-intermediary interaction as the first two links of the aid chain enables a better understanding of the individual motives and the identification of immediate and second-order consequences of the respective behavior. To abstract from the complexities of the resource transfer as experienced in reality allows isolating the incentives for the strategic decisions of the players in a general model. Both players have imperfect information in this classic principal-agent setting. The donor always moves first; in other words, the donor needs to trust in the reputation of the intermediary sufficiently to donate resources in the first place. The donor is expected to maximize utility through donating in the expectation of the largest possible positive impact. The intermediary is expected to maximize funding in order to guarantee its organizational survival by securing the existing financial support, but also by raising new funds.

The first game illustrates the interaction between the trusting donor and the intermediary when the donor has no attractive outside options for donation. The second game portrays the same interaction, but when the donor can choose from alternative intermediaries. The third game depicts the interaction between the critical donor and the intermediary in which the donor has not only other options at hand but also has means to reduce the information asymmetry.

## 2.2. Development assistance for health

The resource flow of development assistance for health is illustrated in Figure 2, using the relevant organizations for sub-Saharan Africa as an example. The principal actors of the aid chain are funding sources, aid intermediaries and implementing organizations. The resources that aid intermediaries transfer can come from public or private sources. National treasuries are the main source for bilateral and multilateral aid agencies as well as global health partnerships. Private citizens provide funds for public sources through taxes as well as through private donations. Private philanthropists, typically large-scale donors, are identified by the volume of their donations. Corporations also make donations, often as part of a social marketing campaign in the spirit of corporate social responsibility.

Figure 2. Resource flow of development assistance for health




*Elaborated from IHME (2009), 14.*[6,7]

The rhetoric about aid effectiveness tends to draw the attention to the intended beneficiaries, using the picture of needy people living in precarious conditions. Beneficiaries do matter because it is ultimately their lives which can be improved, thanks to, for example, effective health interventions. Beneficiaries and recipients can coincide but do not necessarily. Beneficiaries are here understood as the last link of the aid chain and thus as major actor. As mentioned in the beginning, the game-modeling focuses on the interaction between donor and intermediary whose respective behavior can have far-reaching consequences for the subsequent links of the aid chain.

Figure 3 depicts the most important links of the aid chain and the overlapping roles of aid intermediaries for health-related assistance. This representation simplifies the diffuse network of organizations involved in the resource transfer because their position with regard to the monetary flow is only one distinctive feature. In accordance with the origin and the use of their resources, the following three categories can be distinguished: funding, transferring and implementing aid intermediaries. These different types of aid intermediaries constitute a very heterogeneous group.

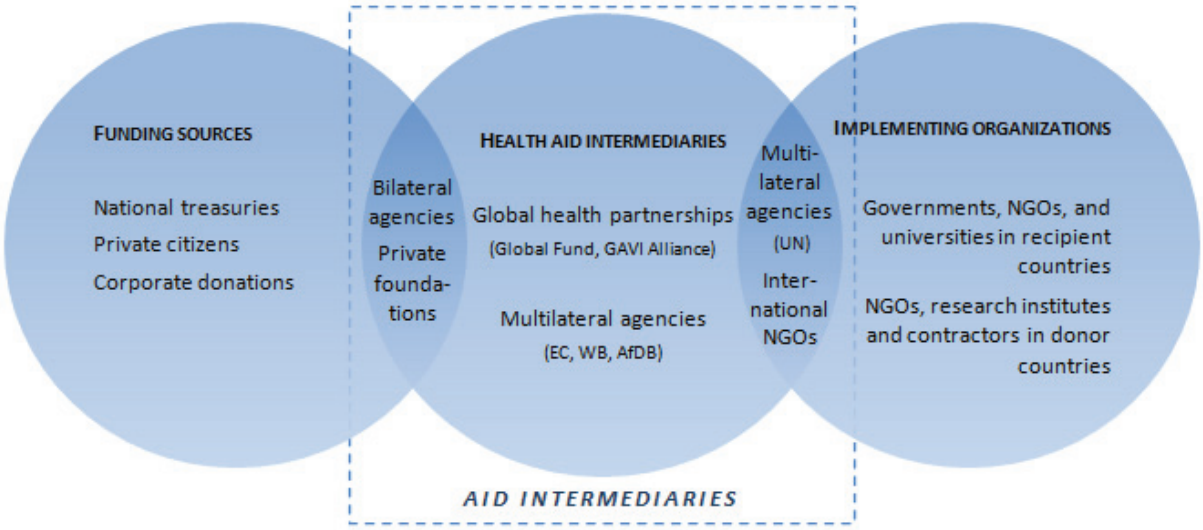
Bilateral aid agencies and private foundations can be considered as funding aid intermediaries due to the large percentage of resources disbursed to other aid intermediaries or implementing organizations. Global health partnerships and most multilateral aid agencies are transferring aid

[6] The primary interest of this figure is to illustrate the resource flow and the participating actors differentiating between three groups: donors, aid intermediaries and recipients. Technically, aid can be given in form of grants or concessional loans, in kind and as debt relief. For the sake of simplification, debt repayment of concessional loans or debt cancellation is not considered further because these flows do not involve any intermediary.

[7] EC = European Commission; UN = United Nations; WB = World Bank; AfDB = African Development Bank; GAVI = Global Alliance for Vaccines and Immunisation.

intermediaries because they primarily transfer funds between donors and recipients. UN agencies and international NGOs can be considered as implementing aid intermediaries because of the large share of development assistance for health used to implement their own health programs and research. (IHME (2009), 15)

Figure 3. Overlapping roles of aid intermediaries




*Elaborated from IHME (2009), 15.*

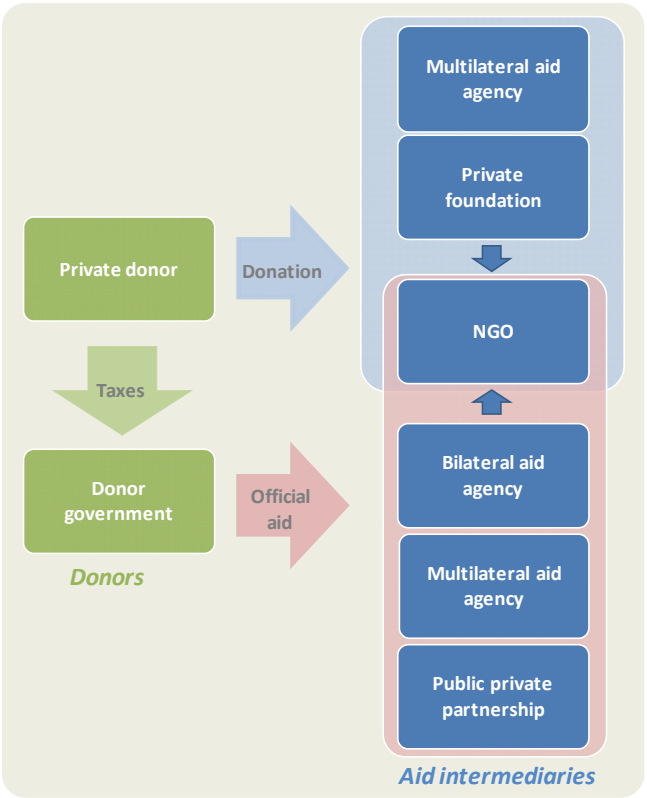
Implementing organizations, as recipients of foreign aid, are another important link of the aid chain that have to make strategic decisions about funding and interventions. The recipient is the last agent of the principal-agent-chain foreign aid. The principal aid intermediary, as financier, expects a certain performance by the implementing organization which is needed to prove the successfully financed intervention against the donor as the original source of funding. The first step for the aid intermediary is to raise funds; in a second step, an intermediary can decide about its allocation. This chapter focuses on the first aspect, the relation between donor and aid intermediary.

## 2.3. Donors and aid intermediaries

The flow diagram in Figure 4 illustrates the resource flow between donors and aid intermediaries. The transfer is depicted between a public donor and a private donor, on the one hand, and health aid intermediaries in the form of bilateral and multilateral aid agencies, public-private-partnerships (PPPs), private foundations and NGOs, on the other hand; the flow diagram is simplified because the interactions with the recipient respectively beneficiary are not illustrated. A private donor, such as a citizen or a company can decide to provide resources in the form of a donation. The aid intermediary to which the donation is most commonly addressed is either a private foundation, a multilateral aid agency (e.g. UNICEF) or a NGO. Apart from transferring resources to an aid intermediary, a private donor can also make a direct donation to an implementing organization; here understood as an

organization that is active locally in a developing country, e.g. a local NGO. These direct donations, however, are not further considered in this study since they do not involve any aid intermediary. Members of the Diaspora can also be private donors because they might consider it "a noble deed to donate some of their resources to the needy and those in a less fortunate situation than themselves." (Bardouille (2008), 22). Donations usually support education and health care services. Such transfers tend to be of direct nature and are therefore not considered further. Official development assistance of a donor country is financed through taxes. Given the indirect funding, the taxpayer has only indirect political leverage on foreign aid through their voting behavior in the next election. A taxpayer supposedly cares less about the marginal share of taxes spent on foreign aid than about investments for domestic matters. (Only Norway, Sweden, Denmark and the Netherlands constantly meet the UN target of providing 0.7% of the GDP as foreign aid; but even in these donor countries, only a small percentage of the national budget is devoted to foreign aid.) Most typically, the donor government transfers official aid to bilateral and multilateral aid agencies. However, NGOs have received increasing co-financing from public donors in the recent past, usually channeled through a bilateral aid agency (Koch et al. (2009), 903). Resources are also directed at public private partnerships such as the Global Fund or the Global Alliance for Vaccines. The public donor can also cooperate directly with an implementing organization. However, this option is not further taken into consideration as any aid intermediary is involved.

Figure 4. Aid flows between donors and aid intermediaries



### 2.3.1. Donors

Private and public donors make strategic decisions with respect to the initial decision to make a donation, the type of organization, the volume and the frequency respectively the duration of the financial commitment. The decision-making process is influenced by the mainstream opinion in the donor community; at least in terms of public donors.[8] It is also influenced by the behavior of other donors, e.g. the decisions of the Millennium Challenge Corporation to grant aid to developing countries appear to have signaled merit of recipients to other donors (Dreher et al. (2010), 12). Private and public donors have imperfect information on the efforts of the aid intermediary. Therefore, they refer to publicly available information such as reports or indicators to assess the performance of the agent and to decide about making a donation. Private contributions may range from big donations by some individuals to very small amounts by millions of private persons (Werker and Ahmed (2008), 78). By definition, a donation is a voluntary resource transfer, in kind or monetary terms, made without any desire for personal returns. Although a small-scale donor can usually define what projects the donation may be used for, it is difficult to control the aid intermediary. The reputation of an organization serves as an indicator of trustworthiness for the small donor, especially prior to any personal experiences. The private small donor disposes of legal remedies only in such extreme cases like fraud. Due to the lack of leverage, a small donor stays rather passive and reacts to the perceived behavior of the intermediary: If the expectations are not met, the donor can decide to end the financial commitment.

It has been claimed that NGOs can reduce ex-post uncertainties about the use of private gifts (Martens (2005), 660). All well-regarded aid intermediaries can be argued to have this potential because any organization that has a reputation to use the donation responsibly and to have little overhead costs creates and fosters the trust of the donor. The combination of trust and reputation reduces ex post uncertainties about the use of private gifts by giving the donor peace of mind. Private large-scale donors have more leverage on the behavior of the aid intermediary. The size of their financial contribution allows them attaching strings to the donation, e.g. they can split the total amount in several donations and make any subsequent contribution depending on the results presented by the intermediary. Consequently, the large-scale donor has the potential to threaten the intermediary and is not confined to passively observe the agent. The underlying motivation for a private donor can be the reduction of taxable income or true charitable motives. The reasons for public donors to engage in resource transfers for health can be many. Their primary concern is not necessarily the neediness of the recipient as regards poor health or the efficient use of the resources. In any case, we assume donors will maximize the possible impact of the financial contribution, regardless of the underlying objective.

[8] Thorbecke (2000) provides a critical overview about thematic changes in foreign aid between 1950 and 2000.

### 2.3.2. Aid intermediaries

The organization of aid management and its location in the bureaucratic hierarchy varies across donor countries in terms of *bilateral aid agencies*. Some governments have unified their aid in one independent cabinet-level agency (e.g. UK), others have located their aid-related activities in the ministry of foreign affairs (e.g. Denmark), while some donor countries have a highly fragmented system where policy and implementation are separated and aid programs are located in a variety of agencies (e.g. Germany) (Lancaster (2007), 22-23).[9] In addition, domestic politics influencing aid are widely shared ideas and norms shaping the aid-giving, the process of political decision-making, what interests compete for influence over the aid's purposes, and the internal governmental organization of aid management (Lancaster (2007), 6). The heterogeneity makes it difficult to clearly distinguish the strategies of the donor government from the strategies of the bilateral aid agency. Independent from the organizational arrangement, some political support of foreign aid is necessary. *Multilateral aid agencies* such as the World Health Organization (WHO) are well-known actors setting international standards for global health. The two most prominent multilateral agencies in general are the World Bank and the European Commission; two international actors "in their own right" (Lancaster (1999), 184). In all cases, a single international agency is jointly delegated by donor governments with often diverging interests (Martens (2005), 656). The term *non-governmental organization* serves as umbrella for an enormous range of diverse organizations which can change substantially over its lifetime. Development NGOs vary in size and sector of activity, religious orientation, their function and their relationships to donors and governments. Whereas governments need to employ "universalistic criteria" and "elaborate rationales" to select clients and favor one group over another, NGOs seem to be conceded a more selective choice of aid recipients (Lipsky and Smith (1989), 631). To pick intended beneficiaries according to religious, ethnic, geographic or other factors may violate the unambiguous criteria used by official aid agencies but is usually not being criticized in the case of NGOs (Koch et al. (2009), 904). In addition, small NGOs tend to focus on specific activities and may be more selective in limiting the number of recipient countries in which they engage (Koch et al. (2009), 906). The dependence on external funding provided by a public donor has been identified as a major factor for the aid allocation by NGOs (Fruttero and Gauri (2005), 761). Despite charitable objectives, the intermediary regards the donor's preferences, the programmatic priorities and the benchmarks used for assessing an organization, in his decision-making. This provides a strong incentive for the NGO to focus on measurable results – for example, the short-term reduction of infant mortality through an educational program on hygiene instead of the long-term benefits of HIV/Aids prevention programs. *Private foundations* can act with complete independence, supporting innovative and untested projects, funding research and investing their capital at below-market rates of return; however, their funds and staff are relatively small (Kramer (2008), 216). The Global Fund to Fight Aids, Tuberculosis, and Malaria (the Global Fund) and the Global Alliance for Vaccines and

[9] In an effort to centralize the aid system, the major German development agencies were formally united into the newly created GIZ (*Deutsche Gesellschaft für Internationale Zusammenarbeit*) on January 1, 2011.

Immunization (GAVI) are entirely new *public-private partnerships* designed to deliver development assistance for health in "fundamentally different ways than have traditional aid agencies." (Radelet and Levine (2008), 431). These new organizations were created because donors apparently expected the reform and reorganization of existing agencies to be more difficult than to establish new mechanisms with different operating principles, mandates and objectives (Radelet and Levine (2008), 438).

Two characteristics are common to all intermediaries and seem to unite them across all differences. First, the acquisition of funds is the decisive element to be part of the international aid business. An aid intermediary aims at securing funding in order to guarantee their organizational survival and, hence, is assumed to maximize funding. Second, since all transactions entail transaction costs according to the economic doctrine, an additional link increases the contractual costs and risks for the parties and causes new principal-agent problems. Therefore, aid intermediaries must offer something to the donor and recipient to offset the additional costs. It has been argued that bilateral aid agencies mediate between the diverging preferences of donors and recipients and can help to reduce transaction costs, depending on the domestic political coalition supporting the aid program (Martens (2005), 654-655).

Given the structure of the aid system, donors and aid intermediaries are essentially involved in a sequential game. The ability of one player to gain his ends depends to an important degree on the decisions that the other player will make (Schelling (1960), 5). Each of the players tries to reach the respective objective employing different strategies that take into account the reactions of the other player. As has been alluded to in the introduction, the boundedly rational individual decision-maker maximizes utility subject to constraints established by the institutional setting in a world of positive transaction costs, in the theoretical framework of the New Institutional Economics. Consequently, institutions, transaction costs and the corresponding incentive structure influence the donor-intermediary interaction, whose result is a resource transfer known as foreign aid.[10] Due to the strategic dependence of one decision-maker on the other, game theoretical analysis will help to understand the economic rationale behind the decision-making process.

## 2.4. The donor-intermediary interaction as game

### 2.4.1. General remarks

The resource transfer from donor to intermediary is modeled as a game with two players.[11] The donor, as principal, delegates decisions to the intermediary as agent. The intermediary must undertake an action that affects the utility or payoff of the donor (Pénard (2008), 162). The interaction is

[10] Institutions are explained in more detail in the chapters 2.4.6 and 4.2.2.

[11] Please note that donations for emergencies are not considered as they represent a one-shot game in which reputation-building does not occur; unless the intermediary is involved in both emergency activities and regular aid activities. Evidence shows that, for instance, NGOs appear during a crisis and quickly disappear after (Jayasinghe (2007), 623).

characterized by imperfect information on both sides. In this classic principal-agent problem, the donor does not know exactly how the organization will spend the money because only the intermediary knows what purpose the donation will be used for. In turn, the aid intermediary is uncertain which expectations the donor has because only the donor knows her preferences.

The games consist of two rounds each with the donor moving first. Given the uncertainty about the intermediary's behavior, the question is what motivates the donor to donate in the first place.[12] The donor needs extrinsic or intrinsic motivation. The driving force in the first case is probably the recognition by others, while it is most likely the urge to do some good in the second case. These two unlike reasons for donating have the same consequence: The extrinsic motivation causes the donor to search for an intermediary with a good standing in order to maximize the likelihood that the financial support will cast a positive light on the donor, while the intrinsic motivation pressures the donor to search for an intermediary with a good reputation in order to maximize the probability that the donation will be used for good purposes.[13] In the end, what matters is the reputation of the intermediary as important signal both for the intrinsically motivated donor and for the extrinsically motivated donor. The higher the reputation is, the greater the trust by the donor that the intermediary will use the resources to the donor's benefit.

The term reputation is not unambiguously defined but contextual. In the following, reputation is defined as a judgment about an actor's behavior in the past, used to form predictions about her future behavior. The reputation of an intermediary is based on his compliance with institutions.[14] A possible internal institution could be a custom to use donations diligently, which is enforced by non-organized societal control such that donors refrain from donating if disobedience is revealed. A possible external institution could be a state law that specifies how donations are supposed to be used and that is enforced by organized state enforcement such that the state punishes the intermediary if noncompliance is revealed. Hence, an intermediary's good reputation means that his past behavior as regards the use of donated resources was judged positively.

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[12] The principal-agent problem inherent to the relationship between donor and intermediary reminds one of the *trust game*. There, the Nash equilibrium in pure strategies is that player one does not provide any resources to player two and that player two is, hence, never asked to play. If player two were ever asked to play, he would choose to cheat as a rational player. Player one would only donate if she were convinced that player two would use the resources responsibly meaning that player one needs to trust player two. (Heap and Varoufakis (2004), pp. 175-180, illustrate how trust, prisoner's dilemma and free riders are connected in social life.)

[13] It is difficult to define what good purposes are because well-intentioned interventions are not necessarily good. For instance, an international NGO declares complete textbook coverage of schoolchildren in a country as objective. Even if the intermediary accomplishes full textbook coverage (and hence the intermediary is judged to have used the resources responsibly), the objective might not have been good in the first place – if textbooks in English are of little use if this is not the children's native language. (For a real life example, read Glewwe et al. (2009) which documents the many consequences for test scores of a mismatch between student needs and textbooks.)
Therefore, in our context 'good' means here that the intermediary used the donated resources for what he had promised them to be used. In other words, from the perspective of the donor, the intervention is 'good' because she expects the resources to be used as intended, based on the belief to have chosen a trustworthy intermediary.

[14] Voigt and Kiwit (1998) develop a taxonomy of institutions, which are understood as commonly known rules that are subject to an enforcement mechanism. They distinguish between *internal* institutions sanctioned by the society and *external* institutions sanctioned by the state.

The two players maximize their expected utility. The donor is expected to maximize utility through donating resources for good purposes.[15] The aid intermediary is expected to maximize funding in order to guarantee its organizational survival by securing existing resource transfers and raising new funds. The utility numbers assigned to outcomes of the game are ordinal utilities. They capture the player's ordering, but neither provide a measure of the intensity of a player's preference, nor can they be compared across players (Heap and Varoufakis (2004), 9). The players' utilities are assumed to be directly proportional to their pay-offs, in other words the players are assumed to be risk neutral.

*Strategies*

The finite strategy set consists of the following pure strategies available to each player. The donor (D) chooses among three possible strategies:

(1) {no} = {n}

(2) {yes; no} = {y; n}

(3) {yes; yes} = {y; y}

The aid intermediary (A) has four possible strategies to choose from:

(1) {walk the talk; walk the talk} = {w; w}

(2) {walk the talk; only talk} = {w; t}

(3) {only talk; walk the talk} = {t; w}

(4) {only talk; only talk} = {t; t}.[16]

In both rounds, *D* chooses between *donating (y)* and *not donating (n)*. *A* chooses between walking the talk and only talking. The first strategy *walk the talk (w)* means that the intermediary *A* keeps his word. The intermediary fulfills the defined objectives which have been communicated via leaflets, reports or online material to the potential donor. Playing this strategy, *A* needs to bear costs in the sense that the possible uses of the resources are limited or that the intentions need to be communicated but it helps to guarantee future funding. The second strategy *only talk (t)* implies that *A* does not attempt to live up to previously identified objectives. As a consequence, *A* does not incur any costs because no strategic adjustment is needed.

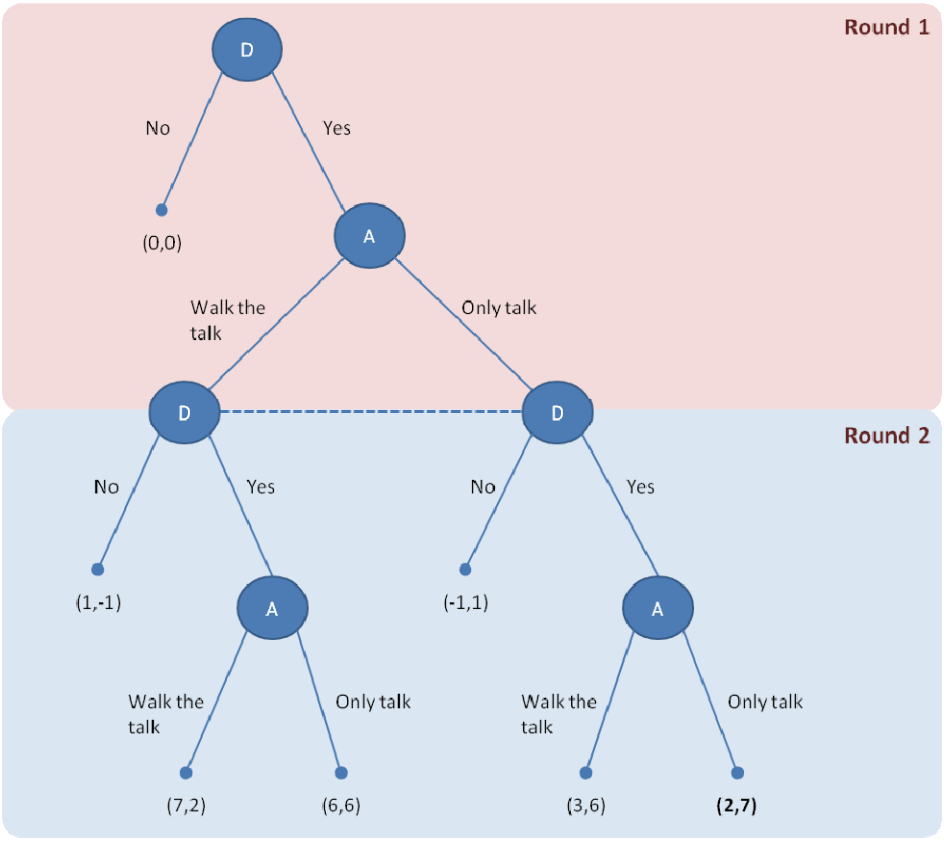
[15] A private donor wants to maximize satisfaction with a donation, assuming that the resources will be used for 'doing good'. A public donor wants to maximize political support by the public in the donor country, which he hopes will translate into votes during the next election.

[16] The strategy *only talk* could also be called *cheat* respectively the strategy *walk the talk* could be called *respect*.

### 2.4.2. The trusting donor game I

The structure of the game in extensive form is shown in Figure 5.

Figure 5. The trusting donor game I




*Payoffs*

The players are expected to rank their preferences in order to maximize their expected utility as follows. The best possible scenario for *D* is the donation to be used in her best interest by *A* in both rounds. The assigned payoff is the highest ($P_1^{yy} = 7$). The second best is if *A* uses the donation in the expected way at least in the first round because it validates the initial trust which *D* put in *A*'s reputation. The assigned payoff is high ($P_1^{yy} = 6$). The third best outcome for *D* is that *A* only talks in the first round but walks the talk in the second round. In this case, the reputation of *A* as a trustworthy intermediary has suffered in round one and is not fully recovered by *A*'s behavior in round two. The donor's confidence in the reputation of the intermediary has been shaken much more in the second scenario than in the first one. The assigned payoff is moderate ($P_1^{yy} = 3$). A worse scenario is that *A* cheats in both rounds and simply does not take into consideration the intended purposes of the donation. The assigned payoff is low ($P_1^{yy} = 2$). It is also possible that *D* does not donate again but opts out in the second round. If *A* kept his word in round one, *D* does not feel to have wasted resources. The assigned payoff is low ($P_1^{yn} = 1$). The less preferable scenario is that *A* has only done talking and thus wasted the donation in the eyes of the donor. The assigned payoff is negative ($P_1^{yn} = -1$).

The best possible scenario for *A* is to receive donations and to only do the talking. In this case, *A* takes full advantage of the information asymmetry because, first, it is difficult for *D* to supervise *A* and, second, *D* is unlikely to supervise *A* given the trust of *D* in *A*'s reputation. *A* receives funding but does not invest in keeping her word. The assigned payoff is high ($P_2^{tt} = 7$). The second best outcome is to receive donations in both rounds but to only walk the talk in one round. This means that *A* is able to raise funds in both rounds but adheres to the previously identified objectives, which limits the alternative use of the resources, in only one round. The sequence of cheating and respecting does not affect the utility level of the intermediary. This outcome yields a high payoff ($P_2^{wt} = P_2^{tw} = 6$). Another scenario leads to a lower utility level. *A* uses the funds in both rounds as defined by the own objectives. The assigned payoff is moderate ($P_2^{ww} = 2$). The fact that *D* stops donating in the second round because, for instance, *D* has run out of resources, leads to two different outcomes. In one case, *A* did only the talking. This strategy yields still a low payoff ($P_2^{t} = 1$). In the other case, *A* invested in fulfilling the objectives since he kept his word. The assigned payoff is negative ($P_2^{w} = -1$).

*Solution*

According to the logic of backward induction, it is concluded that the player moving first will decide what to do by considering what the player moving second will do. Players work out their strategies backwards; donor and aid intermediary induce their beliefs about what constitutes the wisest choices by starting at the end and then moving to the beginning (Heap and Varoufakis (2004), 91).

In the first round, *D* chooses between *y* and *n*. The payoff for not making a donation is zero ($P_1^{n} = 0$). As a rational individual, *D* compares this payoff to all other possible outcomes of the game. If *D* plays *y* in round one, *A* decides between *w* and *t*. When *A* is asked to play, in other words to decide whether he respects the objectives or only pays lip service, *A* also compares across all possible alternatives. Two aspects are important for *A*'s strategic decision. First, in general the possible payoffs of playing *t* are higher than those of playing *w*. Second, it is possible that *D* ends the game in the second round by not donating anymore. Given this risk, *A* compares the payoffs when *D* would opt out: On the right-hand side, he would not have lost any resources to please the donor in the first round. On the left-hand side, *A* kept his word but would not be trusted any longer; the responsible behavior is not being rewarded. *A* would achieve a lower utility level than if *D* had not donated in the first place. Hence, *A* plays only talk. In the second round, *D* does not know whether *A* has kept his own promises because she does not know at which information node she is on. As a consequence, *D* must randomize between the left-hand side and the right-hand side, each with probability one-half. Due to *A*'s preferences, *D* anticipates that *A* will always do only the talking in the second round. Therefore, the relevant comparisons are on the left-hand side ($(0.5 \times (P_1^{yn} = 1) = 0.5) < (0.5 \times (P_1^{yy} = 6) = 3)$) and on the right-hand side ($(0.5 \times (P_1^{yn} = 0) = 0) < (0.5 \times (P_1^{yy} = 2) = 1)$). Consequently, *D* will always opt for strategy *y* in the second round. When asked again to play, *A* will always play *t* due to the higher payoff. Comparing the payoff of the strategic combination {y; y} to the strategy {n}, *D* will donate in

round one. The strategic combination {d; t; d; t} is a Nash equilibrium in pure strategies. These strategies of the players are best replies with respect to each other.

*Interpretation*

The above donor-intermediary interaction is similar to the Samaritan's Dilemma, depicted by Buchanan (1977) and revisited by Gibson et al. (2005). In this two-person game, the Samaritan, an actor concerned about the well-being of others, extends help regardless of the recipient's behavior. Anticipating the Samaritan's reasoning, the recipient expends low effort. The Nash equilibrium in pure strategies is {help; low effort}.

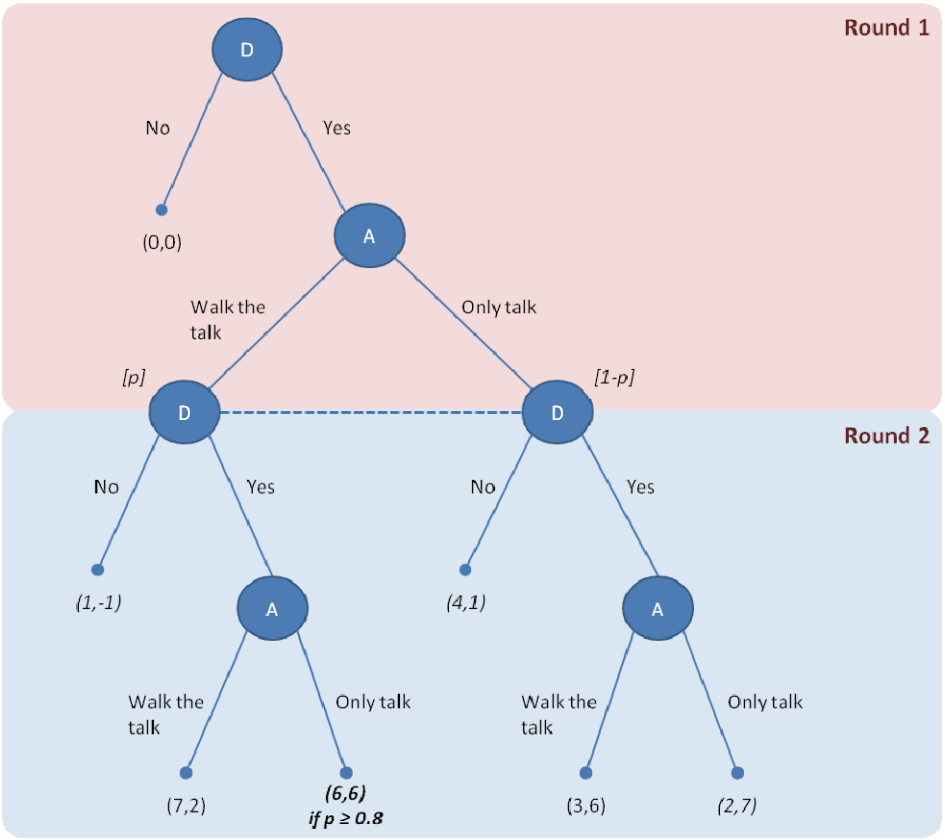
In our game, the donor is also better off donating, independently from the intermediary's behavior. The urge to strive for recognition by others respectively the feeling to do some good incentivizes the donor to search for an intermediary with a good reputation. The initial trust in the organization makes the donor transfer the resources and delegate the decision-making to the intermediary. Due to asymmetric information, the donor is uncertain about how the intermediary uses these resources in round one. Although the donor wants the intermediary to use the donation responsibly and has the option to stop donating if the intermediary does not act as promised, the donor is very unlikely to exit, as the exit option is not very appealing.

### 2.4.3. The trusting donor game II

In the previous game, the donor is trapped because there are no alternatives or no attractive alternatives. It is unattractive because the transaction costs for the donor caused by the change to an alternative intermediary are higher than the potential benefits. Transaction costs can be high for many reasons. For example, the donor might have difficulties to obtain information on alternative intermediaries and their trustworthiness, or to change intermediaries is costly because a personal visit at the bank is necessary for a bank transfer, since the donor has not access to online banking.

In the following, the donor-intermediary interaction is modeled as a scenario in which the exit option becomes indeed appealing. Translated into game-theoretical terms, this means, first, that the strategic decision of the donor to exit in the second round, after her initial trust was apparently not rewarded, yields a higher payoff than before and that, second, the outside option transforms into a threat of a funding cut for the intermediary. The structure of the game in extensive form is shown in Figure 6.

Figure 6. The trusting donor game II




*Solution*

As rational individuals, both players compare their payoffs to all other possible outcomes of the game. In the first round, *D* chooses between *y* and *n*. The payoff for not making a donation is zero ($P_1^n = 0$). If *D* plays *y* in round one, *A* decides between *w* and *t*. When *A* is asked to play, he still faces the situation that the possible payoffs of playing *t* are higher than those of playing *w* and that *D* can theoretically end the game in the second round by not donating anymore. The difference is that now he also knows that *D* has an attractive outside option in case she believes that *A* paid only lip service and did not use the resources for the intended purposes. If *D* is at least 80% certain to be at the information node on the left-hand side, in other words that *A* walked the talk, *D* will play *y* in the second round. Anticipating *D*'s decision, *A* walks the talk in the first round. Most likely *D* will choose to be loyal with the intermediary (and thus donating) instead of exiting (and thus stop donating). When asked again to play, *A* will always play *t* due to the higher payoff. Comparing the payoff of the strategic combination {y; y} to the strategy {n}, *D* will donate in round one. The strategic combination {y; w; y; t} is a Nash equilibrium in mixed strategies. These strategies of the players are best replies with respect to each other.

*Interpretation*

*D* is still unable to fully discriminate whether *A* used the resources responsibly or whether they were wasted. The exit option is only appealing to *D* if *A* cheated in the first round. Otherwise, it makes more sense to maintain the relationship. Technically, *D* does not know whether she is on the left-hand side or the right-hand side of the extensive game tree. Since her initial decision to delegate resources to *A* was based on *A*'s good reputation, *D* knows that *A* is aware of the competition by other intermediaries, which can make the option to exit relatively attractive for *D*. In other words, *D* practically trusts to be at the information node on the left-hand side. She trusts in *A*'s reputation but also that she is able to credibly threaten *A* with opting out in the second round.

On the contrary, the intermediary *A* has an incentive to make the donor *D* believe to be on the left-hand side although, in fact, *A* has used the resources for other purposes. In this case, the intermediary needs to assure the donor that the donation was used as intended because *A* knows of the risk that *D* might not donate again and might search for an alternative organization.[17]

### 2.4.4. The critical donor game

So far, we have argued that the principal trusts in the intermediary. It is also possible that the donor is very critical about the activities of the intermediary, despite the initial trust to make a donation. We have commented in the beginning that the extrinsic respectively intrinsic motivation leads the donor to search for an intermediary with good standing. This means that the donor tries to reduce the asymmetric information ex ante by word of mouth or charity certificates, as a reference to get an idea of the organization's trustworthiness. She will acquire the information as long as the transaction costs are lower than the benefits she yields from the knowledge that the intermediary is supposedly trustworthy. Different from the previous situation, we will now consider the interaction between a critical donor and an intermediary. Two differences to the other game are noteworthy: First, the critical donor bears additional transaction costs after the initial donation in order to control the intermediary. Such ex post transaction costs can be to read the annual reports diligently, for instance. As a consequence, D knows in which part of the information set he is in the second round of the game. The decisive aspect is that the critical donor is able to indeed monitor the intermediary in such manner that the information asymmetry is abrogated. Second, as in the previous game, the outside option of the donor in the second round represents a credible threat of a financial cut to the intermediary and consequently yields a high payoff. The structure of the game in extensive form is shown in Figure 7.[18]

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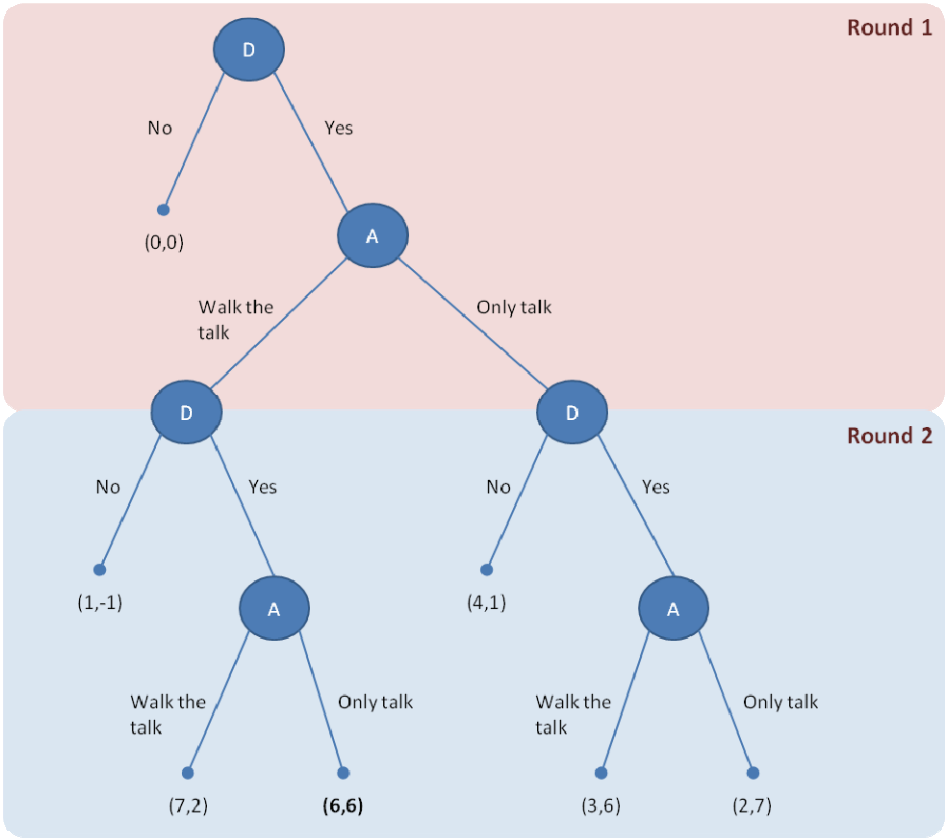
[17] Withholding funds respectively redirecting funds to other activities is the exit option, while continue donating is the loyalty option in this game. The concept of exit, voice and loyalty is based on Hirschman (1970). He describes the voice option as "the only way in which dissatisfied customers or members can react *whenever the exit option is unavailable*." (Hirschman (1970), 33; italics added). In our context, however, the exit option (not to donate) is always available – what changes is its attractiveness. Hence, the voice option has not been considered further in this model.

[18] Conflicting interests between donor and intermediary are here assumed. It is theoretically possible that the interests of donor and intermediary are perfectly identical. This case, however, is not considered further because it implies that no conflict of interest exists despite continuing information asymmetries between donor and intermediary.

Figure 7. The critical donor game




*Solution*

In the first round, *D* chooses between *y* and *n*. The payoff for not making a donation is zero ($P_1^n = 0$). If *D* plays *y* in round one, *A* decides between *w* and *t*. The possible payoffs of ignoring his promises are still higher than if he keeps his word. Different from the previous game, he does not only know that *D* has an attractive outside option in case she believes that *A* paid only lip service. He also knows that *D* can distinguish whether he kept his word or whether he did not use the resources for the intended purposes. If ever *A* plays *t* in the first round, *D* will exit. In this situation, *A* will have reached a higher utility level than if *D* had not donated in the first place but loses much more attractive outcomes related to a renewed donation by *D*. Anticipating *D*'s decision, *A* walks the talk in the first round. In the second round, *D* can choose between loyalty with the intermediary (and thus donating) or exit (and thus stop donating). If *D* thinks that the intermediary cheated she will exit (and search for a more trustworthy intermediary). If *D* can be sure that *A* acted according to the defined principles, *D* will play *y*. *D* is aware that her outside option poses a credible threat on *A*. Therefore, she knows that *A* has used the money as intended and will donate again. When asked again to play, *A* will always play *t* due to the higher payoff. Comparing the payoff of the strategic combination {y; y} to the strategy {n}, *D* will donate in round one. The strategic combination {d; w; d; t} is a Nash equilibrium in pure strategies. These strategies of the players are best replies with respect to each other.

*Interpretation*

The donor and the intermediary are connected by the transfer of resources, the donation. Size and specificities of the donation convey valuable information about donor and intermediary to each other. The intermediary partitions donations into big and small according to the threshold, whether the financial contribution is substantial for the intermediary or not. The greater the donation, respectively the higher the relative dependence of the intermediary from the donor is, the more likely the donor attempts to exert some sort of pressure. The more specific the earmark is, the more likely the donor has sought information about the organization, its activities and maybe even their usefulness. The intermediary can use these details of the donating process as hints to whether the donor is likely to grant freedom to the intermediary or whether she is interested in monitoring.

The intermediary classifies donors into two groups, the critical and the trusting donor. The critical donor is most likely characterized by substantial donations that signal the donor's potential to exert pressure respectively by earmarked donations that signal her interest for the activities. On the contrary, the trusting donor is most likely characterized by small donations without specific designation, reflecting the low profile of the donor. In other words, the *critical* donor examines the organizational activities meticulously and attempts to monitor the activities of the intermediary, while the *trusting* donor trusts in the intermediary and does not inquire about the spending policies or the agenda of the organization.[19] Based on the donation, its size respectively its specificity, the intermediary assumes that the donor is willing to search for alternatives if she is not satisfied with the intermediary. In this case, the competition by other intermediaries represents a credible threat and incentivizes the intermediary to act accordingly to his good reputation at least in round one.

### 2.4.5. Limitations

Concluding, possible drawbacks of the games need to be mentioned. First, donor and intermediary have been modeled as individuals in the game. No distinction has been made between individuals and organizations, which act as donor respectively intermediary in reality. If individual interests diverge from the collective interest, the individual group member may not act in the best interest of the group. Indeed, collective-action problems present a major obstacle to sustainable development outcomes (Ostrom et al. (2001a), 9-11). Moreover, agents involved in foreign aid delivery have a variety of motives and objectives which are not necessarily congruent with the official, publicly announced, organizational objective (Martens (2002b), 178). The relationships among the major actors involved in international assistance help understand how the foreign aid system generates incentive patterns that affect sustainable outcomes (Gibson et al. (2005), 64). The policy process may face incentive-related problems, perverse incentives may affect the international development assistance process or donor agencies, as well as their contractors, may suffer from perverse incentives leading to undesired

[19] At the extreme, the critical donor attempts to manipulate the intermediary to suit her interests.

outcomes (Ostrom et al. (2001b), 5-6). Aid intermediaries are constrained by institutions as the rules of the aid game. Institutions and their corresponding organizational incentive structures affect the aid delivery process and thus the effectiveness of foreign aid (Martens (2002a), 18). Therefore, a more explicit and systematic understanding of institutions and the incentives emerging within the internal organizational structures is fundamental (Gibson et al. (2005), 224). Not to consider the human beings involved in the realization of aid projects and to ignore conflicting agendas between different links of the aid chain, will lead one to overlook two important explanations for failure (Carr et al. (1998), 2, 44-46).

This missing distinction contradicts the concept of methodological individualism, emphasizing the individual decision-maker, and would certainly be an interesting extension, but it would also sacrifice the beauty of the games. In their simplicity, they allow to model diverse and complex relationships between a multitude of donors and intermediaries in the same theoretical framework, and are, hence, applicable to all five possible interaction situations between donor and intermediary in the realm of development assistance for health.

Second, the modeling of the donor-intermediary interaction does not take the role of the recipients explicitly into consideration. On the one hand, this might appear as a serious limitation because, in real life, recipients are omnipresent in the aid game. On the other hand, the exclusive focus on donor and aid intermediary sharpens the understanding of the mechanisms at work at the beginning of the resource transfer, which we are mainly interested in. The focus on recipients would shift the discussion more on the effectiveness of aid, which will be commented on in the next chapter.

Third, the options for the intermediary are modeled as respect or cheat. Using mixed strategies, one could model the decision-making process as ‘a little more’ and ‘a little less’. This would change the rational strategic behavior of the players, but it would not change the basic framework of the game.

Fourth, the games analyze the interaction between intermediary and trusting, respectively critical, donor separately because the intermediary is modeled as being able to perfectly discriminate between the two donor types. If the intermediary cannot discriminate perfectly between the trusting and the critical donor, his incentive structure changes and he will most likely choose a mixed strategy. In such a situation, the intermediary has an incentive to assume the donor to be critical. Since the trusting donor has attractive outside options in game two, she needs to be relatively certain about the prudent behavior of the intermediary in order to not opt out. The critical donor in game three disposes of a credible threat. Hence the lower his discriminatory power is, the better off is the intermediary to assume the donor to be willing to leave.[20]

Fifth, it has been implicitly assumed that both players have a low time preference. External shocks such as the financial crisis are likely to affect the behavior of both players. The funds made available by donors shrink due to their reduced budgets and the greater uncertainty, respectively. As a consequence, the intermediary experiences a substantial downturn in his funding as well. Under such

[20] The situation in game one, however, remains unchanged.

circumstances, the long-term charitable objectives of a well-known and highly regarded intermediary can quickly transform into short-term concerns about the maintenance of staff and infrastructure. In other words, reputation, as a mechanism of feedback and pressure, becomes less important because the external factors cause the organizational survival to become the immediate concern – regardless of the donor's preferences. The high time preference causes the exit option to lose its importance and consequently, the threat to leave no longer influences the intermediary's behavior.

### 2.4.6. Concluding remarks

The motivation of the donor is extrinsic or intrinsic in nature. The decision to donate is based on the trust in the reputation of the intermediary that the resources will be used prudently (or on the ability of the intermediary to create a 'good feeling' if he is a market entrant). The interaction between donor and intermediary has been modeled as a sequential game. The first game illustrates that the donor is trapped if there are no attractive outside options. It depicts a situation in which the intermediary has a quasi-monopolistic status and in which the reputation mechanism fails. The second game shows that the donor behavior, in other words the threat to leave and to search for an alternative, depends on the ability of the intermediary to convince the donor that the donation is used as intended. It illustrates the interaction in a polypoly in which the reputation mechanism can work. The third game shows that the donor can reach a position in which she incentivizes the intermediary to focus on her preferences. It depicts how the feedback mechanism works when the donor has a quasi-monopolistic status.

The donation has the potential to convey valuable information from donor to intermediary. While the intermediary uses the donation as a proxy for the donor type he is dealing with, the donor uses the options to donate as a proxy for the intermediary's behavior. The possibility to sponsor specific projects related to health or education, for example, signals that the intermediary is willing to offer a feedback mechanism which allows a certain monitoring by the donor. Earmarked donations imply higher transaction costs for the intermediary than a simple standing order because the intermediary needs to keep track of the resources and communicate their use back to the donor. Keeping the differences between donors in mind, it is likely to observe a pre-selection among them. A donor who selects an organization that offers some feedback such as letters written by the sponsored child, signals interest for the agenda but also expresses a desire to monitor the intermediary.[21] As a consequence, the critical donor is more likely to select an intermediary that offers options including direct and earmarked donations. An intermediary is, hence, incentivized to offer a broad portfolio of donation options as a signal that the donor is welcomed to be closely involved with the intermediary's activities. It is also possible, however, that the intermediary only offers these options to maximize the pool of

[21] International child sponsorship is probably the "most intimate and direct form of involvement with the poor in the developing world" (Wydick et al. (2011), 1). It is estimated that, currently, child sponsors provide $3.2 billion to international child sponsorship programs each year, and 8.36 million children are sponsored internationally (Wydick et al. (2011), 1).

potential donors. Then, the donor has difficulties to distinguish an honorable intermediary from a dishonorable intermediary. In the long run, first, the latter would crowd out the former and, second, the donor would not make any donation because she knows about the shirking intermediaries.[22]

In the beginning, it has been commented that the reputation of an intermediary is based on her compliance with institutions. As a reminder, reputation is the expectation about an actor's future behavior based on the judgment of her past behavior. Institutions are defined as commonly known rules that are subject to an enforcement mechanism; *external* institutions are sanctioned by the state, while *internal* institutions are sanctioned by the society by definition (Voigt and Kiwit (1998), 85, 87). The interdependencies between institutions and reputation are of the following nature in the context of the donor-intermediary interaction. For instance, a court of justice convicts an intermediary of fraud with donations and sanctions the intermediary with a penalty as an official sanction of the state for breaking a law. In addition, the society might sanction the intermediary as well for incompliance with a custom which established the principle to use donations diligently. In this case, the intermediary is punished via non-organized societal control by disseminating information about his noncompliance in order to diminish his reputation. A third option is that the intermediary is part of an organization or associated with an organization which has established specific private rules, whose noncompliance is punished by the organization, in other words by organized private enforcement. For example, the DZI (*German Central Institute for Social Questions*) issues evaluations on German charities and awards a seal of approval for truthful and prudent fundraising, signaling reliability and transparency. If the intermediary stops complying with the rule of diligence with donations, the association withdraws the seal of quality as an organized private sanction for noncompliance.

In all cases, the donor needs information on the reputation of intermediaries from third parties, including the loss of reputation, in order to be able to make an informed decision. For this feedback mechanism to work, critical voices such as the media or other watchdogs such as the DZI are necessary. If these critical voices do exist, the reputation of an intermediary, indeed, can suffer considerably from negative news coverage: After a funding mismanagement scandal, UNICEF Germany lost 37,000 sustaining members, the seal of approval from a German ratings agency and suffered a damage of 7 million Euros because earnings had dropped by 20 percent (Süddeutsche Zeitung (2008)). In this case, many donors chose to stop donating because they were worried that the donation would fund a professional fund-raiser instead of the charity projects aimed at children.

The donor's decision to exit is affected by the prospective transaction costs which she will likely have to bear when scanning alternatives.[23] At first sight, it appears that the willingness to search for other

[22] Similar to the "Market for Lemons" (Akerlof (1970)); where the buyer anticipates that all cars for sale are lemons and the market eventually breaks down.

[23] As a rational individual, however, sunk costs have no impact on whether the option to exit remains attractive to the donor or not.

intermediaries is proportional to the donated amount. Hence, a donor making a substantial financial contribution would have more leverage on the intermediary because her threat to leave is more probable and thereby more credible. Nevertheless, even a small donor making a marginal financial contribution might be willing to change the intermediary due to low transaction costs.[24] For instance, a standing order respectively a bank transfer can be altered at relatively low costs. Even search costs are likely to be marginal because intermediaries are often very active in providing information about themselves and their activities to the public; in other words they actively use signaling to disseminate positive information. In addition, the information provided by third parties on the reputation of an intermediary, including changes in the reputation, implies a significant reduction of transaction costs for the donor, particularly for small donors. The interdependency between institutions, reputation and information causes the transaction costs of an adequate substitute, a trustworthy intermediary, to be relatively low. The precondition for the feedback mechanism to work is, however, that external sources for information of the donor do exist.

A general behavioral model for donor-intermediary interaction, as regards foreign aid flows, has been developed. In the context of development assistance for health, it is necessary to keep in mind that aid resources are used to fund short-term and long-term direct and indirect health interventions. For example, if funds are used to purchase oral rehydration salts to hydrate children suffering from diarrhea, this intervention is likely to produce short-term results and, therefore, is tangible; such an intervention and its outcome can be easily reported on. Preventive measures such as vaccination against childhood diseases are more likely to change health outcomes mid-term. Programs such as educating parents on safe delivery, pregnancy and care of the neonate to limit child deaths or educating parents on difficult breathing as symptom of pneumonia will lead to behavioral changes in the best case but rather mid-term. On the one hand, the spectrum of possible health interventions increases the discretionary power of the aid intermediary because the longer time horizon can be used as excuse why no immediate or short-term results can be delivered. On the other hand, the need to secure funding on a yearly basis in order to be able to maintain staff, infrastructure and ultimately projects forces the intermediary to focus on interventions that can produce results in the short run. In other words, the pressure that a donor is able to exert can prevent the intermediary from cheating but it can also cause him to finance ‘promising’ projects – not necessarily those that will help the most vulnerable.

In the limitations, we have commented on how quickly external shocks can change the time preferences of the intermediary, which, in turn, reduces or makes the importance of reputation disappear. Consequently, we need institutions and a low time preference for the feedback mechanism reputation to work.

[24] Since the introductory remarks with respect to the changed landscape of health intermediaries can be easily extended to other areas of foreign aid, the general heterogeneous landscape of intermediaries offers many alternatives for donors.

## 2.5. Conclusion

In the beginning, the added value of the intermediary as an additional link in the aid chain was questioned. The modeling of the interaction between donor and recipient as a game has illustrated this added value as the ability to get donors in developed countries involved with problems of recipients and intended beneficiaries in developing countries. An aid intermediary offers a bridge between donor and recipient. Based on reputation, the donor trusts the intermediary to use the donated resources for good purposes as intended. The intermediary administers resources from the donor to the recipient and information from the recipient to the donor.

The sequential games model three interaction situations between donor and intermediary. In each situation, the reputation mechanism has a different effect. In the first interaction, between trusting donor and intermediary, the reputation mechanism fails because the donor has no outside option. In the second case, the trusting donor has the option to exit. Even with the credible threat of a financial cut, the intermediary still benefits from the asymmetric information which hinders the feedback mechanism reputation. As long as the donor is convinced that the resources are used as intended – the definition of good employed here, the donor will not opt out. In the third interaction, between critical donor and intermediary, the donor is able to monitor the intermediary. Reputation works now as direct feedback mechanism.

The game modeling enables a closer look at the (broken) feedback loop between donors and recipients, which is much emphasized in the literature. It allows understanding of the importance of reputation, how this mechanism is related to institutions, and under which conditions it is likely to work. The games also emphasize the importance of third parties as external sources of information in order to make reputation an effective mechanism. The logic of the modeled interaction can be applied to the five types of intermediaries relevant for health assistance.

# Chapter 3
# Overview of existing studies on the decision-making process of foreign aid

## 3.1. Introductory remarks

Foreign aid literature centers on two main themes. One strand of literature studies the determinants of aid allocation. The positive analysis of the motivation for aid transfers, provided by donors and disbursed to recipient countries, is connected to the normative question of why foreign aid should be given, and to whom. The second strand of literature, the debate of aid effectiveness, shifts the focus to the underlying mechanisms. The aim here is to expound under which conditions aid is likely to reduce poverty and promote growth.

The question around the effectiveness of foreign aid to promote growth and development in the recipient countries has been fiercely discussed for several decades. Two of the most powerful voices in this discussion are Jeffrey Sachs as advocate of foreign aid and William Easterly as critic of foreign aid. The former argues that a historically unprecedented increase of foreign aid, a 'big push', is needed to get especially sub-Saharan African countries out of the 'poverty trap' and to 'make poverty history' (e.g. Sachs (2005)). The latter argues that aid programs on a large scale, designed by 'planners' are condemned to fail, criticizes the lack of accountability, transparency and monitoring of the big players in foreign aid, and advocates 'searching' for small-scale solutions that work in a specific contest (e.g. Easterly (2007)). The discussion about aid effectiveness, however, is likely missing two important points. First, foreign aid is given with many intentions and is used for multiple purposes by donor governments, despite the "aid-for-development norm" (Lancaster (2007), 7). Second, not all developmental purposes have the same time horizon. Aid interventions can have a rather long time horizon and consequently development effects can only be expected in the long-run: for example, the reduction of infant mortality might support growth in the long-run (Clemens et al. (2004), 2).[25]

The analyses of the determinants of foreign aid and the studies of aid effectiveness are often presented as separate questions. One can argue that regardless of the initial motivation for selecting a recipient and allocating aid, it is interesting to grasp the potential of aid to induce growth and development in the recipient countries. However, one can also argue that the underlying reasons for selection and aid allocation most likely define its impact. Regardless of the argument, a sharp distinction between the two questions does not appear to be very helpful.

The work presented in this doctoral thesis naturally complements and builds on the existing literature on aid determinants. The consensus in the more recent literature is that many aspects

[25] In the following, we will focus our attention on the determinants of the decision-making process for health assistance. For more information on the discussion on aid effectiveness and related issues please refer to the recent contributions of Mavrotas and Nunnenkamp (2007), McGillivray et al. (2005), Arndt et al. (2010), and Isopi and Mavrotas (2009).

influence the aid allocation decision, among them donor interest and developmental criteria. In the following pages, we will discuss the few studies that explicitly distinguish between the selection stage and the allocation stage among the many empirical analyses of aid determinants. Subsequently, influential studies on aid allocation and recent empirical studies on aid allocation are presented, focusing on aggregate and disaggregate cross-country analyses of bilateral donors of panel data. Table 1, at the end of this chapter, provides a comprehensive overview of relevant studies since the 1970s. The type and period of study, the focus of the analysis, the estimation technique, the dependent variable and the independent variables as well as the main findings are summarized.[26]

In the previous chapter, the term aid intermediary comprised the group of bilateral aid agencies, multilateral aid agencies, private foundations, public-private partnerships and international NGOs. In the remainder of the thesis, bilateral aid agencies are referred to as bilateral donors for two reasons. First, it follows the tradition of the foreign aid literature and facilitates comparisons of the empirical results to previous studies on foreign aid. Second, it is only theoretically possible to distinguish between the national government as donor and the bilateral aid agency as intermediary, at least in cross-country analyses.

## 3.2. Analyses of the selection and allocation decisions

Dudley and Montmarquette (1976) were the first to introduce an explicit distinction between the selection and allocation decision. In the two-step decision-making procedure, first, eligible recipient countries are selected and, second, the amount of aid is allocated.[27] The results support the hypothesis that the selection probability is negatively correlated with the per capita income and positively correlated with the population of the potential recipient. The evidence for aid allocation suggests economic and political links to be very important, while the relative importance of the recipient does not provide a conclusive picture.

Svensson (1999) analyzes the question whether aid is channeled to more democratic countries. Following the idea of a two-stage selection model of foreign assistance, the selection decision is estimated using a probit model with random effects and the aid allocation is estimated via ordinary least squares (OLS). Using initial income, population size and time-specific effects as control variables, the probability to receive aid from Canada, the US and Japan is positively correlated with democracy. The relationship between aid allocation and democracy is significantly positive for the UK

[26] Dollar and Levin (2006) provide a survey of more recent studies on aid allocation. The literature on aid effectiveness and selectivity is reviewed by McGillivray (2003a). McGillivray and White (1993) survey also earlier analyses which used less frequently used econometric models.
Some studies analyze the aid determinants for one specific bilateral donor; recent examples include Tuman et al. (2009), Tezanos Vázquez (2008), Faust and Ziaja (2011). For an overview including studies of individual donors please refer to Neumayer (2003b).

[27] It has been argued that the driving forces in both stages are different: The choice of recipients is more likely the result of a political process, while the aid allocation decisions are more likely the results of the aid administration bodies (Tarp et al. (1998), 13). The original argument has been made in the context of Danish foreign aid. In principle, however, it seems reasonable to assume, also in other donor countries, the eligibility stage to be more influenced by voices of the political realm and the allocation stage to be the result of the operational abilities in the aid administration bodies.

and significantly negative for France, Germany and Japan. The findings suggest that the individual donor decision is driven by different motives. Since the set of independent variables is limited, however, the results need to be interpreted cautiously.

Questioning the importance of human rights in the decision-making process of bilateral donors, Neumayer (2003a) uses a two-part model to analyze the selection decision via probit estimation with random effects and the allocation decision via OLS. All donors are more likely to select poor countries, with the exception of Portugal, and to give more aid to poorer recipient countries, with the exception of Luxembourg, New Zealand and Portugal. Almost all donors are more likely to select populous countries and to provide more aid to them. All donors are more likely to select a former own colony, except Japan and the Netherlands, and also to provide more aid to their own colonies, except Japan and the United States. While trading partners are slightly more likely to be selected in some cases, economic ties have a significantly positive effect for allocations by most donors. The distance between donor and recipient has no consistent effect on the decision-making process. US military aid increases the selection probability marginally in some cases. Major donors allocate more aid to these recipients while Scandinavian donors and the Netherlands do not. Despite their statistical significance, civil rights and personal integrity rights have only a marginal impact on the selection decision. Their effect is inconsistent as regards aid allocation.

The same technique is used in Neumayer (2003b) to analyze the impact of good governance on development assistance. The results show that poorer countries are more likely to be selected as recipients. Basically all donors allocate greater aid shares to poorer countries. Most donors give preference to populous countries in their selection and allocation decisions. The effects of a better physical quality of life index are inconsistent across donors. It increases the selection chances by Sweden but is insignificant for its allocation decision. Being a former colony increases selection chances by some major donors and aid receipt from most major donors. Although only Canada is more likely to select and to allocate more aid to a major importer, economic links increase the aid provision of Japan, Germany and France. While political similarity has no statistically significant effect for the selection decision, Denmark is the only donor that favors politically similar countries in its allocation decision. The donors that select more likely predominantly Christian countries are not the same as the donors that provide more aid to these recipients. The same effect can be observed for political freedom and low regulatory burden. The effect of human rights is inconsistent both for the selection and the allocation decision. The UK and Canada select recipients with low corruption more likely, while the corruption level has basically no effect on aid allocation. The rule of law has no consistent effect on selection decisions and is statistically insignificant for the allocation decision. While US military grants are basically statistically insignificant for the first decision, they have a significantly positive impact on the second decision by most donors. Recipients' military expenditures have no consistent effect on the selection or allocation decisions.

Berthélemy (2006) analyzes the individual behavior of bilateral donors with respect to their allocation decisions. The estimation uses Heckman and a two-part model, in which fixed effects are introduced only in the allocation equation. The results of the selection equation are not reported due to methodological and computational difficulties and, hence, the interpretation of the results focuses on the allocation decision. The results suggest that, on average, the donors allocate aid to poor countries and to recipients with small populations. Democratic countries are allocated more aid.[28] While conflicts between states seem to lower the allocated aid, the coefficient on internal conflicts suggests an increase in aid resources; however, the significance is at the 10% level, which is probably too low given the high number of almost 30,000 observations. The debt burden is insignificant. Total donor's aid, other donors' aid and multilateral aid increase aid allocation. Colonial ties and geopolitical interests of the United States in Latin American countries and of Japan in Asian countries are significantly positive.[29]

Although the literature on the process of country selection for foreign aid is relatively scarce, and some studies do not report or interpret the results for the selection equation, the findings illustrate that the often implicitly assumed congruency between the determinants of eligibility and the determinants of aid allocation is not entirely correct. The available evidence shows that motives for selection and motives for allocation may or may not have the same effect in some instances.

## 3.3. Influential studies on aid allocation

The early influential empirical study on aid allocation by McKinlay (1979) shows that, although economic, security and power political interests are the decisive factors for aid allocation, the combination and the intensity of interests pursued are different for the UK, France, Germany and the US. Yet, the results have to be interpreted with caution because the regression tables lack information on the statistical significance of the coefficients.

Focusing on bilateral aid to the African continent, the cross-country analysis of Schraeder et al. (1998) analyzes American, Japanese, French and Swedish foreign aid policies. Bilateral aid is influenced by donor interests that depend on the historical background and their position in the global system. Aid is not given for altruistic reasons; but ideology, strategic interests and trade relationships are significant.

The influential study by Alesina and Dollar (2000) analyzes the pattern of bilateral aid allocation using panel data. Political and strategic considerations of the donor are as important as or even more

[28] Political rights and civil liberties indices have been converted in a democracy/non-democracy dummy variable. This conversion can be subject to debate given that the Freedom House index measures primarily the degree of freedom in a country.

[29] The comments refer to the results of the Heckman maximum likelihood model respectively the similar OLS estimates. The other results for the allocation equation need to be interpreted cautiously. The fourth and fifth column report the results of the fixed-effects model including coefficients on time-constant variables such as colonial links. This is at least surprising given that a fixed effects model does not permit the estimation of time-constant variables.

important than the recipient's policy or political institutions. At an aggregate level, first, the colonial past and political alliances are the major determinants and, second, more aid is given to poor countries. Nonetheless, the individual analysis reveals major differences among donors. Nordic countries seem to target their aid to the poorest countries and to reward good policies and political institutions. France and Japan, however, appear to care most about their own former colonies and favorable votes in the UN. The time series evidence is that foreign aid flows respond to political variables such as democratization episodes, but not systematically to policy reform.

In a widely cited and influential publication, Burnside and Dollar (2000) examines the relationships among foreign assistance, economic policies and growth of per capita income, including the analysis of aid allocation for lower-income countries. The results for the allocation of bilateral aid as a share of GDP show that smaller and poorer countries receive more aid. Measures of good policy, arms imports or the geographic location in sub-Saharan Africa, the Franc zone or Central America are insignificant.

Analyzing the aid allocation pattern, another important study by Dollar and Levin (2006) finds that aid allocation has increasingly become selective: At the beginning of the 2000s, bilateral aid has had a positive relationship with 'democracy' on average. Unfortunately, the authors are imprecise about the index they have used as proxy for democracy. The Freedom House indices of political rights and civil rights are primarily an aggregate measure of the extent of freedom in a given country. Part of the index of political rights measures aspects of the political system such as elections. It is therefore at least misleading to conclude from a significantly negative relationship between aid given and the index variable (given that a lower number on the index represents a higher degree of freedom) that donors favor democracies in their allocations. At an individual level, almost all bilateral donors favor 'democracies' in their allocations, except Italy, Greece and Spain. The rule of law variable is only relevant for a minority of donor countries. All bilateral donors allocate aid to poorer countries. Colonial linkages are significant for all former colonial powers except Australia, Japan and the US. The trade variable is relevant for some donors including the like-minded donors Denmark and Finland with the major exception being France and Portugal.

## 3.4. Recent empirical studies on aid allocation

Berthélemy and Tichit (2004) analyze the allocation decisions of bilateral donors in a panel study using a Tobit model with random effects. On average, donors allocate aid to poor countries and recipients with small populations. Recipients with trade ties or former colonial links receive more aid, although the importance of the latter declines over time. Donors seem to have cared about the general level of freedom in the recipient country after the end of the Cold War. At an individual level, France allocates less aid to moderately non-free countries. Population size has a significantly positive effect on allocation decisions by New Zealand and Finland. Germany and Italy allocate more aid to receiving countries with high infant mortality, while most other donors allocate less. Aid allocation by other

donors has a significantly positive effect on the allocation decisions of Germany, the Netherlands, Sweden, the UK and the US, but a negative effect in the case of Belgium, Ireland and Italy. The random-effects Tobit model implies that the regressors for the selection decision and the allocation decision are assumed to be identical; an assumption that can be discussed. The results need to be interpreted cautiously because the authors do not comment on the accuracy of the approximation using quadrature. It is also not intuitive to only lag the independent variable growth by one year meaning that all other regressors are assumed to have an instantaneous effect on aid per capita. The results may hence be biased due to endogeneity.

Younas (2008) focuses on the question of whether recipient nations' imports have an impact on the flow of bilateral aid. Using pooled OLS, the estimations indicate that more bilateral aid is provided to recipients who import capital goods, while other category groups of imports have no significant effects. On average, aid flows are largely determined by the economic and strategic donor interest. The population size has a significantly negative effect on aid per capita. Infant mortality, political and civil rights, multilateral aid per capita and imports relative to GDP have a significantly positive impact on allocated aid. The coefficients on the dummy variables on Israel, Egypt and a majority of Roman Catholic population are also significant and positive. Per capita income, reserves per capita, distance, domestic purchasing power, colonial history and majority of Muslim population have no statistically significant effect. At individual levels, Canada, France and Japan allocate a greater share of aid to small countries. Germany and the UK give more aid to poor recipients. High infant mortality has a positive impact on allocation decisions by the US, Germany and the UK. Only the UK allocates more aid to recipients with greater political and civil rights. Multilateral aid has a significantly positive effect on bilateral aid allocation, with the exception of Germany. Other bilateral aid is significantly positive for all bilateral donors. France and the UK give more aid to their former colonies. Except Japan, all donors allocate a greater aid share to countries with a majority of Roman Catholic population, while the evidence on a majority of Muslim population remains inconclusive. Strategic alliances with Egypt and Israel significantly affect aid allocations by the United States.

Chong and Gradstein (2008) analyze several donor characteristics as possible determinants of allocation decisions. The real income of the donor country has a positive, but only marginal effect on aid allocation. Social inequality in the donor country has a significantly negative effect on the allocated amount. While corruption in the donor country significantly and negatively affects the aid allocation, corruption in the recipient country does not have any impact. The aid given is significantly and positively affected by the volume of tax revenues in the donor country. A greater number of donors lowers the total amount of aid given by each country. A donor government with a left-wing chief executive party gives more aid to developing countries. The positive and significant coefficients on the dependent variables lagged by one period respectively two periods provide evidence that aid allocation depends on decisions taken in previous periods, suggesting path dependency.

Claessens et al. (2009) question whether the criteria for aid allocation have become more selective. In general, per capita income and the Country Policy and Institutional Assessment score (CPIA), as proxy for the recipient country's merit, have become the driving forces of aid allocations. However, the elasticities of individual donors, as regards the key selectivity measures, reveal the remaining large differences. The US, UK, France and Canada seem to gear their aid more toward the poorest countries. The sensitivity results for population size show that the UK and France, and to a lesser degree Germany and the US, are biased toward smaller countries. France and Japan appear to be the most policy sensitive donors. The external debt burden seems to influence aid flows from France, the UK, Canada and Germany most. The findings need cautious interpretation because the results may be biased due to endogeneity as per capita income and trade are the only lagged independent variables.

Isopi and Mavrotas (2009) analyze aid allocation and aid effectiveness on individual donor level using a random effects Tobit model. Despite the significant differences among donors, in general, economic factors appear as more relevant for donors with a colonial past. Small and poor countries receive more aid on average. Some major donors and the Scandinavian donors tend to reward more democratic recipients. Restricting the time dimension of the analysis, both developmental concerns and self-interest seem to motivate the allocation decisions for most donors. Restricting the time dimension under consideration to a more recent period, aid effectiveness emerges as relevant factor for a small group of donor countries.

Hoeffler and Outram (2011) analyze need, merit and self-interest as possible determinants of bilateral aid allocation. On average, a one percent increase in income results in a one percent decrease in per capita aid by the average donor. A one percent increase of aid given by other donors is proportionally complemented by a one percent increase in aid of the average donor. On average, growing economies receive 0.9% more aid. Democracy and human rights are insignificant for the average donor but the UK and Japan allocate more aid to democracies. At aggregate and individual level, donors provide more aid to trading partners, with the exception of the US. On average, donors provide more assistance to recipients voting in line in the UN with France and Japan but less to the UK. The population size and the Post Cold War dummy are insignificant for the average donor. The end of the Cold War led to higher allocations by the UK, France and Japan, while the US decreased its aid contributions. The comparison of the allocation criteria of the average DAC (Development Assistance Committee) donor to the major donors the UK, US, Germany, France and Japan reveals remarkable differences among individual donors: The UK is significantly more responsive to poverty than the average. At individual level, Japan and the UK decrease their aid proportionally to a rise in aid by other donors, while the US increases its aid allocation significantly. The US and Germany provide less aid to recipients with growing economies. Germany, France and Japan give less aid to countries with human rights abuses, while the US seems to give more aid to recipients with worse human rights. At individual level, the UK and the US provide more aid to recipients voting in line in

the UN, while France allocates less. While the UK and France give more aid to small countries, the US and Germany allocate more aid to more populous recipients.

## 3.5. Concluding remarks

This literature review highlights the importance of analyzing the motives for country selection and the motives for aid allocation separately. It also shows that the finding for the behavior of the average donor can vary considerably from the conclusions drawn from a disaggregate study of individual donor behavior. The available evidence suggests that, in most cases, there is no consistent pattern across donors and no systematic difference between donor groups. Reviewing the literature ultimately reveals that only few analyses mention the different models available for the analysis of the selection respectively allocation stage and even less discuss the econometric implications. Unfortunately, it is often left to the reader's interpretation why the choices of the econometric approach were made.

Some of the analyses summarized in Table 1 control for strategic considerations. These considerations played an important role for foreign aid policies during the era of the Cold War. Yet, military concerns such as the strategic importance of the receiving country for the donor government, are secondary in this study. On the one hand, military spending, maintenance of a security alliance between donor and recipient, as well as the size of the military force appear to be negligible issues when it comes to health assistance. The volume of development assistance for health, compared to the overall assistance, is too small to be used as a tool to enhance the national security of the donor. On the other hand, the international environment was transformed in the post-Cold War period of the 1990s: former recipients graduated to the role of donors with their own aid programs, increased multilateral aid, the emergence of new aid recipients in Eastern Europe and the former Soviet Union, cutbacks in many bilateral aid programs, as well as the controversy regarding the proper role of foreign aid as an instrument of foreign policy (Schraeder et al. 1998: 294).

Table 1. Selected empirical studies on determinants of aid decisions

| Study, type and period | Focus of analysis | Estimation technique | Dependent variable | Independent variables: Donor characteristics | Independent variables: Recipient characteristics | Independent variables: Relationship | Independent variables: Others | Main findings |
|---|---|---|---|---|---|---|---|---|
| Davenport (1970): cross-sectional, 1962-64 | Bilateral (15) and multilateral donors (separately) | OLS | Aid p.c.<br>Aid/GNP | | Real income<br>Consumption p.c.<br>FDI/GDP<br>Foreign reserves/imports<br>Population | | | Positive relationship between income p.c. and aid p.c. |
| Henderson (1971): cross-sectional, 1967-68 | Bilateral and multilateral aid | OLS | Aid p.c. | | Population<br>GNP p.c.<br>GNP p.c. growth rate | | | Population size statistically significant relationship with aid p.c.; regional variations in allocations |
| Wittkopf (1972): cross-sectional, 1961, 1964, 1967 | Bilateral donors (4) | OLS | Aid<br>Aid p.c. | | Length of independence<br>Population<br>Common border with communist state*<br>Trade with "Soviet bloc" states<br>GDP p.c.<br>Balance of trade<br>Increase in exports | Trade volume | ODA from "Soviet bloc"*<br>Bilateral aid from other donors<br>Multilateral aid | Aid allocation follows different principles (US: Cold War considerations; France, UK: political importance reflected in trade ties);<br>only population positively and significantly correlated with aid allocations |
| Dudley and Montmarquette (1976): cross-sectional, 1970 | Bilateral donors (14) | Two-part model (Probit, OLS) | Aid | Exports | Population<br>GNP p.c.<br>Regions* | Colonial experience* | Aid from other donors | *Selection*: population (+), GNPpc (-);<br>*Allocation*: historic (+), economic (+) |
| McKinlay (1979): cross-sectional, 1960-1970 | Bilateral donors (4) | OLS | Aid p.c. | Gross trading ties<br>Trade share<br>Security ties | Population<br>GDP p.c.<br>Military resources<br>Militarism<br>Growth rate<br>Party bans<br>No. of military coups<br>*and many donors* | | Communist bloc (trade share, security ties* etc.)<br>Domestic communist support | Donor interest (political, economic) driving force; albeit differently pursued by individual donors |
| Dowling and Hiemenz (1985): cross-sectional and panel, 1970-72, 1976-78 | Bilateral and multilateral aid | OLS | Aid p.c. | | Population<br>Income p.c. | | | Strong population bias, no middle-income bias |

| Study, type and period | Focus of analysis | Estimation technique | Dependent variable | Independent variables: Donor characteristics | Independent variables: Recipient characteristics | Independent variables: Relationship | Independent variables: Others | Main findings |
|---|---|---|---|---|---|---|---|---|
| Trumbull and Wall (1994): panel, 1984-89 | Bilateral and multilateral aid | OLS (fixed and random effects) | Aid p.c. | | Income p.c.<br>Infant mortality<br>Political and civil rights<br>Population | | | Infant mortality as well as political and civil rights are important |
| Wall (1995): cross-sectional, 1979-80, 1984-85, 1988-89 | Bilateral and multilateral aid | OLS | Aid p.c. | | GNP p.c.<br>Infant mortality<br>Political and civil rights | | | Income p.c. as important indicator of well-being; strong population bias |
| Schraeder et al. (1998): panel, 1980-89 | Bilateral donors (4) | GLS | Aid (% of GNP) | | Caloric intake<br>Life expectancy<br>Military spending/force<br>Security alliance*<br>GNP p.c.<br>Ideological stance<br>Region* | Level of trade<br>Former colony* | | Aid no altruistic tool of foreign policy; heterogeneous donor behavior |
| Svensson (1999): panel, 1970-1995 | Bilateral donors (10) and multilateral donors (3) | Two-part model (Probit and OLS) | Total aid and aid as % of GDP | | Democracy<br>Real GDP p.c.<br>Population | | | Groups of countries show different pattern; selection in the 1990s was not driven by democracy level of recipient |
| Svensson (2000): panel, 1980-1994 | Aggregate bilateral and multilateral aid | 2SLS | Aid as % of GDP | | GDP p.c.<br>Terms of trade<br>Corruption<br>Population<br>Region* | | | No systematic aid allocation to less corrupt recipients |
| Alesina and Dollar (2000): panel, 1970-1994 | Bilateral donors (15) | OLS, Tobit | Total bilateral aid | | Real GDP p.c.<br>Population<br>Trade openness<br>Democracy<br>Civil liberties<br>Rule of law<br>Israel* Egypt*<br>Cultural affinity | UN voting similarity<br>Colonial status | | Aggregate: donor's political and strategic considerations decisive<br>Individual: colonial past and political alliances as major determinants but significant variation among donors |
| Burnside and Dollar (2000): panel, 1970-1993 | Bilateral and multilateral aid | OLS | Aid/GDP | | GDP<br>Population<br>Policy<br>Sub-Saharan Africa*, Egypt*, Franc zone*, Central America*<br>Arms imports | | | Smaller and poorer countries get more aid; good policies insignificant, donors' strategic interests insignificant except for Egypt as ally of the US |

| Study, type and period | Focus of analysis | Estimation technique | Dependent variable | Independent variables: Donor characteristics | Independent variables: Recipient characteristics | Independent variables: Relationship | Independent variables: Others | Main findings |
|---|---|---|---|---|---|---|---|---|
| Alesina and Weder (2002): panel, 1970-1995 | Bilateral donors (16) | OLS, Tobit | Aid p.c. | | Income<br>Population<br>Openness<br>Democracy<br>Corruption | Colonial experience<br>UN voting similarity<br>Bilateral friendship* | | Less corrupt countries do not receive more aid |
| McGillivray (2003b): cross-sectional, 1980 | US | OLS, Tobit | Aid p.c. | Arms transfers p.c.<br>Export share<br>Western hemisphere*<br>Special relations*<br>(Israel, Egypt) | GNP p.c.<br>Population<br>Infant mortality rate<br>Annual GDP growth | | | Both DI and RN variables seem relevant; found population bias contradictory to typical assumptions of these models |
| Neumayer (2003a): panel, 1991-2000 | Bilateral donors (18) and multilateral donors (3) | Two-part (Probit and OLS) | % of total amount of aid | | GDP p.c.<br>Population<br>Perceived Quality of Life Index<br>Country dummies*<br>Democracy<br>Human rights<br>Military expenditures<br>Corruption<br>Rule of law<br>Regulatory burden | Colonial status<br>Exports<br>Political similarity<br>Religious similarity | US military grants | *Selection*<br>Preference for populous and poor countries; donor interests negligible but former colonies more likely selected; institutional quality statistical significant<br>*Allocation*<br>Preference for poor and populous countries; integrity rights inconsistent effect; former colonies, trade partners and US military grants increases aid |
| Neumayer (2003b): panel, 1985-1997 | Bilateral donors (21) | Two-part (Probit and OLS) | Aid as share of total net ODA | | Population<br>GDP p.c.<br>Personal integrity rights<br>Political rights and civil liberties | Colonial experience<br>Value of exports<br>Distance | US military aid | *Selection*<br>Poor countries more likely to be selected; population size and distance without consistent effect; preference for own colonies; human rights inconclusive<br>*Allocation*<br>Low income, population size consistently positive effect, colonial experience sometimes; human rights inconsistent effect; In general, heterogeneous decision pattern among donors |

| Study, type and period | Focus of analysis | Estimation technique | Dependent variable | Independent variables: Donor characteristics | Independent variables: Recipient characteristics | Independent variables: Relationship | Independent variables: Others | Main findings |
|---|---|---|---|---|---|---|---|---|
| Berthélemy and Tichit (2004): panel, 1980-1999 | Bilateral donors (22) | Tobit | Aid p.c. | | Real GDP p.c.<br>Population<br>GDP growth<br>FDI<br>Infant mortality rate<br>Primary school enrolment<br>Civil liberties and political rights | Trade<br>Former colony*<br>US-Egypt* | Aid p.c. given by other donors | Recipients' performances as well as donors' interests influence assistance policies |
| Berthélemy (2006): panel, 1980-1999 | Bilateral donors (22) | Heckman, two-part (probit and OLS) | Aid commitments | | GDP p.c.<br>Population<br>Democracy*<br>Internal conflict* | Interstate conflict*<br>Debt burden<br>Trade<br>Colony* (several)<br>US-Egypt*<br>US-Latin America*<br>Japan-Asia* | Other donors<br>ODA p.c.<br>Multilateral ODA p.c. | *Selection*: not reported due to partial results;<br>*Allocation*:<br>- aggregate: trade linkages, colonial links decisive; multilateral aid and other donors' aid complemented<br>- individual: clusters of 'altruistic', moderately 'egoistic' and 'egoistic' donors |
| Dollar and Levin (2006): panel, 2000-2003 | Aggregate aid and bilateral donors (22) | Tobit | Gross disbursements | | Democracy<br>Rule of law<br>GDP p.c.<br>Colony*<br>Export shares*<br>Distance* | | | Aid allocation has increasingly become selective; positive relationship with democracy; most donors favor close recipients |
| Isopi and Mavrotas (2009): panel, 1980-2003 | Bilateral donors (20) | Tobit | Aid commitments p.c. | | Population<br>GDP p.c.<br>GDP growth<br>Government<br>Infant mortality<br>Gini index | Trade<br>Arms transfers | Social aid<br>Past outcomes | Recipient need and donor interest motivate allocation; heterogeneous results across donors; some greater focus on aid effectiveness recently |
| Nunnenkamp and Thiele (2006): panel, 1998-2002 | Bilateral and multilateral aid | Tobit | Aid | Exports | Population<br>GDP p.c.<br>CPIA<br>Kaufmann index<br>Reconstruction needs*<br>Colony*<br>Egypt-Israel*<br>Composite indicator (GNI, Kaufmann) | | | Poverty and policy orientation less pronounced than rhetoric suggests; differs between donors |

| Study, type and period | Focus of analysis | Estimation technique | Dependent variable | Independent variables: Donor characteristics | Independent variables: Recipient characteristics | Independent variables: Relationship | Independent variables: Others | Main findings |
|---|---|---|---|---|---|---|---|---|
| Chong and Gradstein (2008): panel, 1973-2002 | Bilateral aid | OLS, GMM | Aid (logged) | Real GDP<br>Gini coefficients<br>Tax revenues<br>Corruption<br>Left wing government | Corruption | Foreign aid | No. of donors | Donor characteristics decisive for bilateral allocation decisions |
| Younas (2008): panel, 1991-2003 | Bilateral donors (22) | OLS | Real aid p.c. | | Population<br>GDP p.c.<br>Infant mortality<br>Political and civil rights<br>Import shares (several)<br>Reserves p.c.<br>Domestic purchasing power<br>Majority Roman Catholic*/Muslim*<br>Israel*, Egypt* | Distance<br>Colony* | Multilateral aid p.c.<br>Other bilateral aid p.c. | Importers of capital goods receive more aid; at aggregate level, economic and strategic donor interest largely defines aid flows |
| Claessens et al. (2009): panel, 1970-2004 | Bilateral donors (22) | OLS | Net aid transfer p.c. | Donor sum of net aid transfers | GDP p.c.<br>Population<br>CPIA<br>Burnside-Dollar (2000)<br>External debt burden | Bilateral trade | Net aid others | GDP p.c. and the CPIA are driving forces of allocations; large differences among individual donors as regards key selectivity measures. |
| Hoeffler and Outram (2011): panel, 1980-2004 | Bilateral donors (22) | Two-stage (OLS, with fixed effects) | | GDP p.c.<br>Growth<br>Democracy<br>Human rights<br>Population | Trade<br>UN friend* (UK, US, Japan, Germany, France) | | Other aid p.c.<br>Post Cold War* | Recipient need and self-interest influence allocation decisions; recipient merit less important |

Notes: 1. * denotes dummy variables. 2. The very early empirical analyses of the determinants of aid allocation considered small populations, restricted time periods and a restricted array of independent variables (e.g. Davenport (1970), Henderson (1971), Wittkopf (1972)). In addition, figures on foreign aid flows were sometimes arbitrarily aggregated. For instance, Davenport (1970) pools multilateral aid from such diverse organizations as IBRD, IFC, UNHCR, UNICEF etc. (OECD (1966): XIII). 3. Most studies use the political rights and civil liberties indices of Freedom house but interpret the result with respect to democracy. Such interpretation can be subject to debate given that the Freedom House index measures primarily the degree of freedom in a country. A more appropriate variable for democracy is Polity IV, e.g. used by Hoeffler and Outram (2011). 4. Feeny and McGillivray (2008), building on and extending McGillivray (2005) and Feeny and McGillivray (2004), offer an interesting alternative perspective on aid allocations and pose the question whether donor behavior differs among recipients. They use explanatory variables that are common in empirical aid studies such as population, per capita income, exports, arms transfers etc. but analyze bilateral allocation decisions with respect to recipients. Their findings suggest that donors respond to changes in developmental conditions of receiving countries and that developmental criteria influence the amounts received over time. A drawback of the analysis, noted by the authors, is the implicit assumption of homogeneous donor behavior. Therefore, the results are interpreted as if donors treated different recipients in different ways, although it might as well be that recipients are largely treated the same way but that donors differ in their behavior (Feeny and McGillivray (2008), 527).

# Chapter 4
# Hypotheses on the motives for the selection and allocation decisions

## 4.1. Introductory remarks

In accordance with the established literature on country selection and aid allocation, the set of explanatory variables used in the empirical analyses can be divided into recipient characteristics, donor characteristics, and measures of bilateral relations between donor and recipient. All variables used for the analyses are listed in Appendix A. In the following, first, the theoretical arguments for the hypotheses on selection decisions are presented. The ten hypotheses on selection are grouped in five categories and classified as A. Second, the hypotheses on allocation decisions are developed. The eleven hypotheses on allocation are grouped in six categories and classified as B.[30] Following the hypotheses, the corresponding explanatory variables are presented.

## 4.2. Recipient characteristics

### 4.2.1. Need

The international development agenda, the MDGs, defines the improvement of child health, maternal health and the fight against HIV/Aids as three separate health goals.[31] Against the background of these specifically defined health objectives, one would expect health assistance to be targeted toward countries in which maternal and child mortality rates are high and HIV/Aids is a widespread disease. The donor community has committed itself to these three health objectives, but it is unknown how important health indicators are for the selection of a potential recipient country. It is thus hypothesized:

> **Hypothesis A.1:** *The greater a recipient's need, as expressed by poor health indicators, the more likely it is to be selected.*

The public rhetoric portrays foreign aid as an instrument to alleviate the suffering of needy people, but also as a sign of solidarity between rich and poor. For example, media coverage of health problems like HIV/Aids can raise the awareness of the public in Western countries. The increased sensitivity for the topic can create expectations among the public, specifically, the voters, which can translate into public pressure on politicians. Facing public pressure, politicians would have a strong incentive to consider the global health concerns on the international development agenda. The analysis of aid

[30] Please note that for some, a hypothesis on only either the selection or the allocation is developed; each package of hypotheses is numerated sequentially. The specific reasons for the omission are given along the text.

[31] The health objectives do not share the focus on poverty of the other MDGs but call for improvements in national averages (Gwatkin (2005), 813).

distribution with respect to the MDGs, however, reveals that even those donors with the most progressive aid programs distributed much less aid to the most populous and deprived countries than indicators, for instance, on under-five mortality would suggest (Baulch (2006), 944). When tracking foreign aid for maternal, newborn and child health, the substantial variation in the aid amount per capita at any rate of under-five mortality or maternal mortality suggests that "other factors are important in aid allocation decisions" (Powell-Jackson et al. (2006), 1083). The analysis of the aid portfolio to test for the prioritization of the MDGs reveals that, on the one hand, allocation decisions by various bilateral and multilateral donors are shaped by the fight against HIV/Aids but that, on the other hand, policy statements and allocation decisions diverge enormously (Thiele et al. (2007), 622). Despite putting global health problems on the agenda of the donor community, it is unclear to what extent the allocation decision for health assistance is based on health indicators. It is thus hypothesized:

> **Hypothesis B.1:** *The greater a recipient's need, as expressed by poor health indicators, the more aid is to be allocated.*

*Variables*

Under-five mortality, maternal mortality and HIV prevalence are included as main measures for poor health, in order to control to what extent the selection decision for health assistance is based on health indicators. *Under-five mortality rate* measures child survival and also reflects the socioeconomic and environmental conditions in which children live (WHO (2010b): 112, 229).[32] The improvement of maternal health is assessed by the *maternal mortality ratio* which monitors deaths related to pregnancy and childbirth. The indicator reflects the capacity of the health systems to provide effective health care to prevent and address the complications occurring during pregnancy and childbirth (WHO (2010b): 119).[33] *Prevalence of HIV* is a direct indicator of the burden related to HIV and reflects the prevalence of HIV among the population ages 15 till 49.[34,35]

In addition, we measure need on a broader basis than the specific health indicators mentioned before, and employ logged *GDP per capita*. In the aid literature, per-capita income is the indicator of need commonly used to assess whether poor countries, as recipients in need of aid, are specifically targeted (e.g. Nunnenkamp and Thiele (2006), 1182).

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[32] Under-five mortality is composed of neonatal mortality (death before age one month), postnatal mortality (death from age one month to age one year) and childhood mortality (death from age one year to age five years) (Rajaratnam et al. (2010), 1993). Neonatal and postnatal mortality together are known as infant mortality. Childhood mortality and infant mortality are some measures that indicate the overall health of a country at the macro level (McGillivray et al. (2011), 5).

[33] At the country level, it can provide only a rough idea, due to the very large confidence limits of maternal mortality estimates (WHO (2010b), 121).

[34] *Deaths due to HIV/AIDS* is the leading indicator to measure the burden of disease related to HIV/Aids, the impact of interventions and the success of program implementation (WHO (2010b), 61). As this indicator is available for only a few years, we have substituted it by the above prevalence indicator which provides more comprehensive data.

[35] In all three cases, the reverse causation (high aid allocation for children's health, maternal health or adult health resulting in low mortality rates) should not pose a major problem due to the significant time lag between an aid intervention and a measurable change in health outcomes. In addition, all time-varying independent variables are lagged in the regressions.

Although low socioeconomic status and poor health are correlated, health achievements vary considerably across countries with the same income, particularly among poorer countries (WHO (2008), 4). Therefore, the *Human Development Index (HDI)*, as a summary composite index including three basic aspects of human development (health, knowledge and decent standard of living), is used as alternative.[36] Although the index is correlated with per capita income, which is part of the index, the HDI provides a more comprehensive picture, given that countries with similar income can be very different in their human development (UNDP (1999), 129).[37,38]

Finally, the variable logged *population* controls for the heterogeneous nature of recipients whose populations range from small (island) states to large nations. The population size of the recipient matters for two reasons. First, the relative neediness of a more populous country is greater than a less populous country, all other things equal. Second, populous recipient countries tend to be politically and economically more important than those in the same region with small populations.

### 4.2.2. Quality of the institutional environment

Institutions, understood as commonly known rules, endowed with a sanctioning mechanism, that are used to structure recurrent interactions (Voigt (2009a), 8), help to reduce uncertainty. The institutional setting in the recipient country is important for two reasons. On the one hand, donors might reward institutional quality with a higher selection probability because it increases the likelihood that the later aid allocation will be effective. Aid allocated for an intervention in a recipient country with, for instance, a lower corruption level is likely to produce a better outcome, all other things equal. On the other hand, donors might refrain from selecting recipients whose institutional environment lacks quality. Aid allocation to a recipient with, for example, a high corruption level is likely to result in diverted aid flows which will lower the possible impact of the intervention, all other things equal.

The quality of the institutional environment is also important for another reason. The heterogeneous organizational landscape is argued to have increased the competition between intermediaries, for instance between private and public funding. As a consequence, intermediaries are pressured to produce 'success stories'. The competition for funding can cause the intermediary to become risk-averse and to strategically select interventions with higher chances of success. Because the need to deliver satisfying figures, such as reduced poverty headcounts, encourages a focus on those poor whom the market can easily relieve from poverty; not necessarily congruent with those whose

[36] It is designed to capture long-term progress rather than short-term changes (UNDP (2009), 208; UNDP (2010a)). Note that the current reports usually present figures for the penultimate year, while in earlier years data was presented with a three-year lag. The data was integrated in the database according to the principle when the donor had access to the data.

[37] The simple correlation coefficient *r*, as measure of the strength and direction of the linear relationship between two variables, shows that HDI and logged per capita income are strongly positively correlated, with r = 0.79.

[38] Originally, the *Gini* coefficient was included in previous estimations in order to control for the effect of the recipient's level of inequality on the selection probability. Yet, the number of observations in the regressions including the Gini index dropped dramatically due to data availability. Valid conclusions seemed to be difficult; hence, the variable was not included in the final analysis.

poverty is more problematic (Hulme and Shepherd (2003), 404). Analogously for health assistance, it would be more promising to invest in tangible curative health care, than in rather intangible preventive health care. The combination of 'easy to treat' problems, respectively 'easy to implement' interventions, and a favorable environment increases the likelihood that an intervention is successful. Hence, the donor could be inclined to select countries with a favorable environment. Yet, the available evidence is mixed. Although better institutions may motivate higher aid, donors apparently allocate less aid to more economically advanced countries that have better institutions (Nunnenkamp and Thiele (2006), 1186). Aid allocation seems unresponsive to relatively little corruption: neither bilateral nor multilateral aid goes disproportionally to less corrupt governments (Alesina and Weder (2002), 1126-1127). A weakly robust negative relationship between aid and corruption is found in recipient countries which are less likely to have competing social groups, but donors do not allocate aid systematically to less corrupt recipient countries (Svensson (2000), 453).[39]

Since poor institutional settings may increase the absolute need for assistance, but at the same time also lower the potential impact of financial flows from a donor perspective, it is unclear to what extent a favorable institutional environment increases the selection probability. It is thus hypothesized:

> **Hypothesis A.2:** *The more stable the environment, as evidenced by relatively strong institutions, the more likely a receiving country is to be selected.*

Based on this discussion, it is also open to debate whether the quality of the institutional environment attracts more health assistance. The consequential hypothesis is:

> **Hypothesis B.2:** *The more stable the environment is, as evidenced by relatively strong institutions, the more aid is allocated.*

*Variables*

Several indicators are used to approximate the structural differences as regards the quality of the institutional environment in the receiving country.[40] The variable *democracy* is measured on a unified polity scale ranging from -10 (strongly autocratic) to +10 (strongly democratic) (Marshall et al. (2010), 16) and is frequently used in analyses as proxy for the stability in the recipient country. The indicator *rights and liberties* is the non-weighted sum of the annual evaluation of the state of global freedom of individuals with respect to political rights like the electoral process and civil liberties like freedom of expression and belief; the variable was re-coded such that the scale ranges from 1 (least

[39] Since Svensson (2000) focuses on rent-seeking activities in recipient countries, bilateral and multilateral aid is pooled. Consequently, the results describe the behavior of a hypothetical combination of bilateral and multilateral donor, which in reality does not exist.

[40] It has been discussed whether these indicators measure institutions adequately. Glaeser et al. (2004) argue that the Worldwide Governance Indicators (WGI) and the Polity IV variables measure policies rather than institutions (Glaeser et al. (2004): 275-276). Another critique is that some institutional indicators, such as the WGI, measure broad concepts that represent highly aggregate measures (Voigt (2009a): 22). Other institutional indicators such as the International Country Risk Guide are criticized for being based on subjective evaluations by experts, for instance, rather than objective measurement (Voigt (2009b): 123). As a conciliatory remark we can conclude that these indicators are attempts to make institutions measurable but that there is potential for improvement.

free) to 7 (most free) (Freedom House (2009)).[41] *Economic freedom* measures the extent to which the policies and institutions of countries are supportive of economic freedom (Gwartney and Lawson (2009), xxi), on a 0 to 10 scale with 10 representing the greatest degree of freedom. *Government effectiveness*, part of the Worldwide Governance Indicators, captures perceptions of the quality of public services, the quality of policy formulation and implementation, and the credibility of the government's self-commitment, among others (Kaufmann et al. (2010), 4).[42] The indicator ranges from -2.5 to 2.5, with higher values corresponding to higher degrees of government effectiveness.[43] The *Corruption Perceptions Index (CPI)* measures the perceived level of public-sector corruption; the variable has been re-coded such that it ranges from 1 (low corruption) to 10 (high corruption). The extent of rent-seeking activities is a proxy for a bad institutional environment in the receiving country.[44]

### 4.2.3. Recipients' effort

In the literature, it has been argued that "(g)overnment spending on health from domestic sources is an important indicator of a government's commitment to the health of its people" (Lu et al. (2010): 1376). Since the domestically financed health spending reflects the importance of health on the domestic political agenda of recipient countries, donors might consider the ability (or willingness) of a recipient to finance the health system in their selection respectively allocation decision. On the one hand, donors might complement the recipients' financing efforts. On the other hand, a donor might allocate aid funds precisely because the public health system of the receiving country is considered to be underfinanced. A priori, the effect of domestic health financing on the selection decision of donor countries is unknown. Consequently, it is hypothesized:

> **Hypothesis A.3:** *The more the receiving country invests in good health, as evidenced by public health expenditures, the more likely it is to be selected.*

It is also unclear if the recipient government spending for health has an impact on the allocation decision for health assistance. The consequential hypothesis is:

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41 Political rights entail evaluations on the electoral process, political pluralism and participation, and the functioning of government. Civil liberties refer to freedom of expression and belief, associational and organizational rights, rule of law, and personal autonomy and individual rights (Freedom House (2009)).

42 The Worldwide Governance Indicators (WGI) is used as standard indicator for governance, measured in six dimensions (Voice and Accountability; Political Stability and Absence of Violence; Government Effectiveness; Regulatory Quality; Rule of Law; and Control of Corruption); we are primarily interested in *government effectiveness*.

43 The measurement and composition of this indicator variable received a lot of criticism. The main critique is that the underlying concepts are not thoroughly systematized but change with the available surveys (Voigt 2009, 22). Yet, even if the WGI is not an ideal measure, one needs to acknowledge their practical relevance. For instance, the Millennium Challenge Corporation (MCC) uses four dimensions to assess a country's eligibility for MCC assistance: voice and accountability, government effectiveness, rule of law as well as control of corruption. The volume of MCC aid is relatively small but some evidence suggests that MCC decisions might signal merit of recipients to other donors (Dreher et al. (2010), 12); thus the decisions based on the MCC criteria serve as a yardstick for others.

44 Another important variable in many institutional studies is *electoral rules* or *political system*: parliamentary, assembly-elected president or presidential. However, there does not seem to be any strong direct link between these characteristics and the selection decision for health assistance.

**Hypothesis B.3:** *The more the receiving country invests in good health, as evidenced by public health expenditures, the more aid is allocated.*

*Variables*

Government health expenditures are measured by *public expenditure on health* in order to account for differences among recipients with respect to the financing of the national health system.[45] The caveat of using national health expenditures as proxy is that it allows gaining an impression of the quantitative efforts by the recipient government, but not the quality of the health system.

The coverage rate of immunizations is used as a proxy for the general attention that is being paid to public health issues in a recipient country. The *coverage of the third dose* of diphtheria toxoid, tetanus toxoid and pertussis vaccine is used as indicator for the quality of the health system for two reasons. First, the need to vaccinate children under the age of 7 against these three diseases is the same in developing and developed countries. Second, high coverage rates for the third dose of this common vaccine suggest a high health care quality.[46] This indicator is imperfect because it measures the outcome only and it is, hence, impossible to discern immunization campaigns initiated and financed by the international donor community from activities of the national government.[47]

## 4.3. Donor characteristics

### 4.3.1. Rivalry

Foreign aid has long been argued to serve several purposes: "Commitment can be used to deter intervention by a hostile state in the recipient, to discourage the recipient from moving out of the donor's sphere of influence, and to discourage a non-aligned recipient from moving into a rival's sphere of influence." (McKinlay and Little (1978), 461). In terms of allocation decisions, donors tend to allocate relatively more aid to smaller countries in order to maximize the marginal benefit of the disbursement; the marginal political benefit decreases as population increases in comparison with aid allocations to less populous countries (Dowling and Hiemenz (1985), 535).

[45] Initially it seemed adequate to include an alternative proxy measuring the *expenditures per capita* to account for total health expenditures as the sum of public and private expenditures in the recipient country. However, this indicator provided by the World Bank as part of the World Development Indicators measures both public and private expenditures in the recipient country which makes its use as a proxy for a country's own effort impossible.

[46] Children should get five doses of DTP vaccine, one dose each at 2 months, 4 months, 6 months, 15-18 months, and 4-6 years. At least the first three doses are needed for protection; however, this varies with vaccine type used. Usually the other doses are considered booster doses. (WHO (2010a)).

[47] Claessens et al. (2009) find per capita income and the Country Policy and Institutional Assessment score (CPIA) to have become the driving forces of aid allocation. Hence, the CPIA score as proxy for the recipient's merit would be a desirable complement. Yet, the data are publicly available for 2005 onwards only because in mid-2006 the CPIA for 2005 was published for the first time.

*(a) Relative importance*

Hence, donors do not decide independently and autonomously, but take their relative importance in comparison with other donors into consideration in the decision-making process. However, the available evidence is inconclusive. On the one hand, small donors appear to focus on a limited number of major recipients because they select countries with a greater population with higher probability (Neumayer (2003a), 658). For instance, Sweden can only afford to provide assistance to specific countries or regions and is "forced to carve out an international niche by focusing its foreign aid on carefully selected regions or individual countries" (Schraeder et al. (1998), 301; similarly Lumsdaine (1993), 88). On the other hand, donors with a relatively small budget prefer to spend their limited resources where their relative importance for the recipient country is the greatest (Schraeder et al. (1998), 313-314) – often small countries. However, the consequences of the relative budget size of the donor for the selection probability of a potential recipient are unclear. It is thus hypothesized:

> **Hypothesis A.4.1:** *The greater the relative importance of the donor, as evidenced by the relative budget size, the higher the likelihood to be selected as recipient.*

Please note that the focus is on the potential effect of the donor's relative size on the selection of a recipient. It seems logical that the budget size is positively correlated with the aid allocation. Consequently, no hypothesis on the relationship between a donor's relative importance and the allocation decision was developed.

*Variables*

The relative importance of a donor is approximated by the variable *donor size*, which controls for the relative budget share of a donor. It is coded 1 if the donor's annual budget has a share greater than 5% compared to the pooled annual budgets of all donors and 0 otherwise.

*(b) Bilateral competition*

The United States is an important donor in terms of their volume of health assistance.[48] The decisions of this donor with the largest financial contribution are likely to have a signaling effect on the decisions taken by other donors and to cause two distinct reactions. On the one hand, another bilateral donor is likely to choose those recipients that were *not* selected by the United States. Avoiding the direct competition with the US funds ensures that the financial contribution of the donor is relatively

[48] The findings of Chong and Gradstein (2008) suggest donors to be free-riders: a greater number of donors lowers the total amount of aid given by each country. However, Berthélemy (2006) finds that other donors' aid has a significantly positive impact on aid allocation. We controlled for other donors' aid but found that there is little variation between the aggregate bilateral aid because the group of major donors drive these changes. Hence, we believe that focusing on the biggest donor United States allows drawing better conclusions on signaling effects.

important for the recipient. On the other hand, the US selection decision could fuel the decision to select the same recipient; either in order to demonstrate importance on the stage of international relations or simply because the decision is taken as a signal of merit of the recipient.[49] For instance, other US donors and multilateral organizations appear to have interpreted the Millennium Challenge Corporation's (MCC) decisions as signaling merit of receiving countries for more aid; other bilateral donors did not necessarily increase their aid granted but neither did they reduce their aid (Dreher et al. (2010), 12). A priori, it is unclear whether the selection decision by the United States causes a complementary or substitutive reaction by other donors. It is thus hypothesized:

> **Hypothesis A.4.2:** *If a recipient country was selected by the United States, it is also more likely to be selected by other donors.*

The effect of the allocation decision by the United States on the allocation decisions by other donors is also unknown. Hence, it is hypothesized:

> **Hypothesis B.4.1:** *The more aid a recipient country received from the United States, the more aid is being allocated by other donors.*

*Variables*

The variable *US choice* controls for the selection decisions by the United States. The variable *US aid* controls for the volume of allocation decisions by the United States. Allocation decisions of the largest donor are assumed to have a different effect on other donors' decisions, depending on their relative importance. While big donors are expected to complement US allocation decisions with their own aid provision, small donors are expected to show a substitutive reaction, in the sense that they avoid allocating aid to the same recipients. Hence, an interaction term between donor size and US aid controls for possible differences.

From a donor's aid bureaucracy's perspective, the cessation of flows, visible in non-allocation, "can further complicate an already onerous task of allocating aid among an often large sample of developing countries, identifying and weighing up the relative importance a range of often competing factors in a manner (presumably) consistent with policy directives" (McGillivray and White (1993), 18). Due to bureaucratic inertia, it seems reasonable to expect the current year's decision to be based on the previous year's selection. The variable *previous allocation* controls for possible path dependency and represents the aid allocation in the previous year.[50]

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[49] One could oppose that the potential to learn something about the other donors' behavior is rather small as the United States selects almost all recipients. This might be an argument regarding foreign aid, but it is not valid for health assistance. The US selected between 56 and 98 recipients out of 160 potential recipients between 1990 and 2007. The figures vacillate slightly, although the tendency certainly has been to select more recipients over the years.

[50] The selection decisions are probably not independent over the years. As a consequence, it would also be necessary to control for possible path dependency in the selection decision by including the lagged dependent variable. Since its inclusion as right-hand side variable results in issues with perfect collinearity, the investigation of possible path dependency is not possible at the selection stage.

*(c) Multilateral competition*

It has been argued that donors do not decide independently from other donors in the aid allocation literature (e.g. Berthélemy and Tichit (2004), Berthélemy (2006), Younas (2008), Claessens et al. (2009), Hoeffler and Outram (2011)). Thus, it would have been desirable to control for the effect of the selection decisions by multilateral donors or the leading bilateral donor, the United States. However, it seems more likely that these factors determine the actual allocation of health assistance, rather than the selection decision.

Bilateral donors may view their aid as a complement of multilateral aid, with bilateral flows topping up multilateral aid flows or vice versa, as first identified by Dudley and Montmarquette (1976). Evidence from time series data suggests that bilateral aid can be a substitute for aid from multilateral organizations in some cases and a complement in others. While bilateral donors provided more aid to recipients like Egypt, Israel, and Thailand, which received more aid from multilateral donors, the amount for Indonesia, Kenya, Morocco, and the Philippines was reduced in response to increased multilateral aid to these countries (Feeny and McGillivray (2008), 525). A priori, it is unclear what effect multilateral aid has on bilateral allocation decisions. Hence, it is hypothesized:

> **Hypothesis B.4.2:** *The more aid a recipient country received from multilateral donors, the more aid is being allocated by other donors.*

*Variables*

The variable *multilateral aid* controls for the aid activities of multilateral donors and serves as proxy for a possible bandwagon effect on bilateral aid. It measures the total sum of health assistance that a recipient received from multilateral donors in the previous year.[51,52]

We assume that multilateral allocation decisions have a different effect on other donors' decisions according to their relative importance. Big donors are expected to complement multilateral allocation decisions with their bilateral health assistance, while small donors are assumed to allocate in substitutive manner in order to avoid competition with multilateral aid flows. Hence, an interaction term between donor size and multilateral aid controls for possible differences.

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[51] The analysis of substitutive or complementary effects of other donors' aid, US aid and multilateral aid is based on two implicit assumptions. First, decision-makers are unable to influence the budget size, per se, or to increase their funds by reducing the amount allocated to multilateral organizations (Feeny and McGillivray (2004), 104). Second, increasing aid to one recipient country implies a decrease in aid to at least one other; in addition, decreasing aid to one recipient means an increase in aid to another, as donors usually aim spending the entire aid budget (Feeny and McGillivray (2008), 519).

[52] The term multilateral aid refers here to three types of aid intermediaries: multilateral organizations such as the World Bank, the Asian Development Bank and the Inter-American Development Bank; private foundations such as the Bill and Melinda Gates Foundation; public-private partnerships such as the Global Fund to Fight Aids, Tuberculosis, and Malaria (the Global Fund) and the Global Alliance for Vaccines and Immunizations (GAVI).

### 4.3.2. Programmatic preferences

Similar to the argument made for recipient countries, it can be argued that the domestic health expenditures of the donor government reflect the importance of health as topic on the political agenda of the donor country. As a consequence, the health expenditures of the donor country are likely to be correlated with the spending policies for health concerns in recipient countries. It is hence hypothesized:

> **Hypothesis B.5:** *The more the donor invests in health at home, the more aid is allocated to the selected recipient.*

Since donors' preferences such as expenditures, political transparency or social inequality are more likely to determine the actual allocation of health assistance but much less the selection decision, no hypothesis on the effect for the selection decision has been developed.

*Variables*

In an attempt to resolve this issue empirically, we test for the effect of the share of *government health expenditure* in relation to the donor country's GDP.

Higher levels of political transparency, understood as the degree to which the public is able to monitor the activities of the government, are broadly agreed to reduce the possibilities that policy-making is driven by special interests.[53] Since aid agencies and related ministries are part of the donor's political system, the level of political transparency is assumed to affect their ability to follow politics driven by other interests than the neediness of the recipients (Faust (2010), 12). Measures of corruption do not reflect political transparency in a direct and objective manner, but they reflect the extent to which parties involved in illegal transactions are able to divert resources from their original purpose. A higher corruption level is hence an indication of a less transparent political system. In our context, this means that we would expect greater political transparency, thus less opportunities to follow other interests, approximated by a low corruption level, to be positively correlated with the donor's spending policies for health assistance. The Corruption Perception Index controls for the *political transparency* in the donor country, ranging on a scale from 1 (low transparency) to 10 (high transparency).

Since more egalitarian donor countries seem to provide more foreign aid than unequal donor societies (Chong and Gradstein (2008), 10), we also control for the level of inequality in the donor country. The *Gini* coefficient is the most widely used single measure of inequality which refers to

[53] For a more detailed argumentation and analysis of the importance of political transparency in the context of aid effectiveness, please refer to Faust (2010).

relative rather than to absolute levels of poverty. It ranges from 0 (perfect equality) to 100 (absolute inequality).[54] In addition, the *donors' per capita income* is controlled for.

## 4.4. Donor and recipient characteristics

McKinlay (1979) introduced the dichotomy of egoistic behavior, the donor's interests, and altruistic behavior, the recipient's needs, in the aid allocation literature.[55] Studies on aid allocation tend to criticize that, as most available evidence suggests, donors' interests are more important than recipients' needs, and respectively that aid allocation decisions are not driven by recipients' needs. Ignoring any normative aspect of foreign aid, we focus on possible relationships between donors' characteristics and recipients' characteristics. Studies on aid allocation often emphasize that aid transfers are the result of particular economic, political, cultural and historic ties between the donor country and the recipient country.

*(a) Economic relationship*

It has been argued that a donor may pursue economic interests in the receiving country as (potential) trading partner, either as market for its exports or as source of its imports. Long-term commercial relationships can make aid transfers to be of "mutual advantage" (Cassen (1994), 209). Under such circumstances, aid would be given to try to promote growth or alleviate economic difficulties, to ensure the supply of imports or the continuation of exports (Maizels and Nissanke (1984), 884). Particularly bilateral aid is often at least partly tied by the condition to purchase certain goods and services in the donor country (Radelet (2006), 6); such imports could be medical supplies, for instance.[56] It is unclear to what extent economic ties increase the selection probability for a potential recipient of development assistance for health. It is therefore hypothesized:

> **Hypothesis A.5.1:** *A recipient country with an established economic relation to the donor country is more likely to be selected.*

The effect of economic ties on the allocation decisions for health assistance is equally unknown. Thus, it is hypothesized:

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[54] Round and Odedokun (2004) suggest to additionally control for other non-political donor characteristics such as phase of economic cycle, size of the government or fiscal balance and political donor characteristics such as ideological orientation of government or constitutional checks and balances on the government. These variables seem promising to gain a broader perspective on bilateral aid allocation decisions but are of limited use for our analysis, since health assistance is only part of a donor's total aid resources.

[55] The usefulness of such distinction is subject to debate for two reasons. First, it seems logical that donors act as boundedly rational agents maximizing their utility subject to constraints defined by the institutional environment. Second, this distinction is econometrically ambiguous because, if both recipient need and donor interest are assumed to be relevant variables, their separate estimation leads to misspecification due to omitted variables (McGillivray (2003b), 176).

[56] There might be a simultaneity bias when aid is tied, because more tied aid will imply more imports by the recipient from the donor. However, this is controlled for by the lagged independent variable.

**Hypothesis B.6.1:** *A recipient country with an established economic relation to the donor country receives more aid.*

*Variables*

The proportion of a donor's *exports* to a given recipient represents the economic interest in the recipient country as potential market. The share of a donor's *imports* from a given recipient approximates the economic interest in the recipient as source of imports. The trade relations as proxy for the intensity of the economic ties between donor and recipient are measured by *trade volume*, the total trade as sum of exports and imports between donor and recipient.[57,58]

*(b) Political relationship*

In the age of globalization, where complex relations of mutual interdependence are created among actors at multicontinental distances (Dreher (2006), 1092), political integration may increase and political isolation may decrease the probability of being selected as recipient country. For instance, high-level diplomatic representation between the countries reflects the political importance of the receiving country. Despite the rich literature on the importance of the political relationship between donor and recipient for aid allocation, it is unclear to what extent these factors are important for the selection process. Consequently, it is hypothesized:

**Hypothesis A.5.2:** *A recipient country with relatively strong political ties to the donor country is more likely to be selected.*

The evidence on the importance of the political relationship between donor and recipient for aid allocation is mixed. A priori, it is unclear to what extent these factors are important for DAH allocation. It is hence hypothesized:

**Hypothesis B.6.2:** *A recipient country with relatively strong political ties to the donor country receives more aid.*

*Variables*

The Index on Political Globalization accounts for strong political ties. It measures the intensity of political collaboration between countries on a scale of 1 (low) to 100 (high) and is used to approximate the *political integration* of a country on the international level (Dreher (2006)). The *political proximity* between donor and recipient is approximated by the chief executive's party orientation of the

[57] The import and export links respectively the trade volume were not included in the same regressions due to their high collinearity.

[58] Missing values are coded as such in the Correlates of War Trade Data Set because the creators of the dataset believe the assumption that missing data signifies an absence of trade or that dyadic trade continues according to a linear trend to be questionable (Barbieri et al. (2009), 480).

respective government. The dummy variable is coded one if the two governments have the same political color (right, left, center) and zero otherwise.[59]

*(c) Cultural relationship*

Cultural similarities can overlap with a long history of economic or political interaction. Institutional structures of the donor country and the recipient country are often derived from one another and long-standing relationships can result in "linguistic and personal affinities" (Cassen (1994), 209). Linguistic ties as influence of the direction of aid flows have been hardly recognized in the literature. On the one hand, a former colony shares a common language with its past colonial master. This coincidence between language and historic ties makes it difficult to isolate the effect of language. On the other hand, there are circumstances in which the common language between donor and recipient seem to be a driving force for aid allocation. For instance, Canada and other European donors (excluding France) favor French-speaking African countries (Round and Odedokun (2004), 297). The current literature does not provide any evidence for the importance of previous cultural ties for the process of country selection, thus it is unclear to which degree these considerations are important. It is therefore hypothesized:

> **Hypothesis A.5.3:** *A recipient country with characteristics similar to the culture of the donor country is more likely to be selected.*

A priori, the importance of cultural links between donor and recipient for the allocation of health assistance is unknown. It is thus hypothesized:

> **Hypothesis B.6.3:** *A recipient country with characteristics similar to the culture of the donor country receives more aid.*

*Variables*

Several variables are used as proxies for cultural similarities between donor and recipient. The dummy variable *language* controls for linguistic similarities with respect to the common dominant language. It denotes one if the donor country and the recipient country share the same dominant language and zero otherwise. The dummy *religion* checks religious similarities in terms of the common dominant religion. It is coded one if donor and recipient share the same dominant religion and zero otherwise.

[59] All donor governments have used increases in aid as a diplomatic means, a symbol of successful state visits or international meetings (Lancaster (2007), 13). Therefore, we also used the variable *diplomatic exchange* (Bayer (2006)) to control for the diplomatic representation at the level of chargé d'affaires, minister, and ambassador between donor country and recipient country as an alternative measurement of political proximity. Yet, the number of observations in the regressions including the diplomatic exchange dropped dramatically due to data availability. Valid conclusions seemed to be difficult; hence, the variable was not included in the final analysis for this reason.

In order to control for cultural links, the Index on Social Globalization is used as proxy for *social integration* of a country on the international level and is measured on a scale of 1 (low) to 100 (high) (Dreher (2006)).[60]

*(d) Historic relationship*

Previous studies suggest colonial past to be an important determinant for allocation decisions (e.g. Alesina and Dollar (2000)). It has been argued that aid to former colonies is essentially done in order to maintain or expand a sphere of interest (Maizels and Nissanke (1984), 884). A common colonial past can create such a strong link that donor countries may even overlook or ignore potential problems, related to a high level of corruption, in their decision-making process (e.g. Alesina and Weder (2002): 1126-1127).

Although many empirical analyses suggests the common colonial experience of donor and recipient to be a driving force of aid allocation, it is unclear to what extent this link has an impact on the selection decision for health assistance. The consequential hypothesis is:

> **Hypothesis A.5.4:** *A recipient country with particular historic ties, visible in the colonial experience, is more likely to be selected.*

It is equally unknown in how far the historic relationship influences the allocation decision for health aid. It is thus hypothesized:

> **Hypothesis B.6.4:** *A recipient country with particular historic ties, visible in the colonial experience, is allocated more aid.*

*Variables*

The variable *colonial history* serves as indicator for a particular historic relationship between donor and recipient. It controls for the logged number of years since 1900 in which the recipient was a colony.[61] In order to allow for a distinction between a country's own colonies and colonies of others, the variable *own colony* captures the logged number of years since 1900 in which the country was an own colony. The variable *other colony* measures the logged number of years since 1900 in which the country was the colony of another donor.

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[60] Many studies include a variable to control for the *legal tradition* of the countries. For our purposes, it would be interesting to construct a variable that reflects the similarities in legal traditions between donor and recipient. However, this effort seems hardly worthwhile, since the legal tradition is strongly influenced by the colonial past, which is already controlled for.

[61] As regards the inclusion of variables that account for the colonial past of a recipient, there seem to be two main approaches. One includes dummy variables that control for whether the receiving country was a colony at some point in time, arguing that the important aspect is whether a colonial link has existed ever. The other includes continuous variables, often in logged form, that consider for how long the colonial relationship lasted arguing that this is the duration is the decisive factor. Since we find the second argument more convincing, we chose the same approach as Alesina and Dollar (2000). The year 1900 was selected as cut-off, assuming that previous colonial relations in the 17$^{th}$ till 19$^{th}$ century are less important for interstate relations at the end of the 20$^{th}$ and the beginning of the 21$^{st}$ century.

*(e) Geographic relationship*

The distance between the donor's country and the recipient country has been argued to be important in the decision-making process. For instance, it has been shown that geographical proximity renders countries more likely to be eligible for food aid (Neumayer (2005), 403): the closer a country, the more salient is the issue in the public perception and for policy-makers. The relative closeness of a country, in terms of geographical proximity, is related to public attention in another way: Following the "if it bleeds, it leads" rule of journalism (Easterly (2009a), 381), problems only exist if they are reported on. Consequently, one would expect the United States to care more about happenings in Latin America, while European donors focus more on issues on the African continent. However, it has also been argued that a significantly negative effect of the distance variable can only be expected for those countries "that want to promote a regional sphere of influence in giving more aid to proximate countries" (Neumayer (2003a), 654). A priori the importance of distance between the two countries respectively the geographic location of the recipient country for the selection decision is unclear. We hypothesize:

> **Hypothesis A.5.5:** *The smaller the geodesic distance between donor and recipient, the more likely a recipient is selected.*

Round and Odedokun (2004) finds a geographical pattern of bilateral aid allocation with a remarkable tendency to grant aid to neighboring recipients: Australia and New Zealand give much aid to Oceania; Japan to the Asian region; Canada and the United States to the American region; Europe favors Europe but allocates a much larger share to African countries. The importance of distance respectively the geographic location for the allocation of health assistance is unclear. It is thus hypothesized:

> **Hypothesis B.6.5:** *The smaller the geodesic distance between donor and recipient, the more aid is allocated.*

*Variables*

Geodesic *distance* between donor's and recipient's capitals is used as proxy for salience and political importance. The dummy variable *continent* accounts for the respective continental link. It is coded 1 for the continent (Africa, Asia, America, Europe and Oceania) that a recipient country belongs to and 0 otherwise.

## 4.5. Summary

Table 2 summarizes the hypotheses on selection decisions.

Table 2 Overview of hypotheses on selection decisions

| | |
|---|---|
| Need | |
| **A.1** | The greater a recipient's need, as expressed by poor health indicators, the more likely it is to be selected. |
| Quality of the institutional environment | |
| **A.2** | The more stable the environment, as evidenced by relatively strong institutions, the more likely a receiving country is to be selected. |
| Recipients' efforts | |
| **A.3** | The more the receiving country invests in good health, as evidenced by public health expenditures, the more likely it is to be selected. |
| Rivalry | |
| **A.4.1** | The greater the relative importance of the donor, as evidenced by the relative budget size, the higher the likelihood to be selected as recipient. |
| **A.4.2** | If a recipient country was selected by the United States, it is also more likely to be selected by other donors. |
| Relationship | |
| **A.5.1** | A recipient country with an established economic relation to the donor country is more likely to be selected. |
| **A.5.2** | A recipient country with relatively strong political ties to the donor country is more likely to be selected. |
| **A.5.3** | A recipient country with characteristics similar to the culture of the donor country is more likely to be selected. |
| **A.5.4** | A recipient country with particular historic ties, visible in the colonial experience, is more likely to be selected. |
| **A.5.5** | The smaller the geodesic distance between donor and recipient, the more likely a recipient is selected. |

Table 3 summarizes the hypotheses on allocation decisions.

Table 3 Overview of hypotheses on allocation decisions

| | |
|---|---|
| Need | |
| **B.1** | The greater a recipient's need, as expressed by poor health indicators, the more aid is to be allocated. |
| Quality of the institutional environment | |
| **B.2** | The more stable the environment is, as evidenced by relatively strong institutions, the more aid is allocated. |
| Recipients' efforts | |
| **B.3** | The more the receiving country invests in good health, as evidenced by public health expenditures, the more aid is allocated. |
| Rivalry | |
| **B.4.1** | The more aid a recipient country received from the United States, the more aid is being allocated by other donors. |
| **B.4.2** | The more aid a recipient country received from multilateral donors, the more aid is being allocated by other donors. |
| Programmatic preferences | |
| **B.5** | The more the donor invests in health at home, the more aid is allocated to the selected recipient. |
| Relationship | |
| **B.6.1** | A recipient country with an established economic relation to the donor country receives more aid. |
| **B.6.2** | A recipient country with relatively strong political ties to the donor country receives more aid. |
| **B.6.3** | A recipient country with characteristics similar to the culture of the donor country receives more aid. |
| **B.6.4** | A recipient country with particular historic ties, visible in the colonial experience, is allocated more aid. |
| **B.6.5** | The smaller the geodesic distance between donor and recipient, the more aid is allocated. |

# PART III Data description and methodology

# Chapter 5
# Data description

## 5.1. Data

The sample for this thesis consists of balanced panel data with dyadic data on flows of development assistance for health from donor to recipient. The dataset comes from the Institute for Health Metrics and Evaluation, an independent global health research center at the University of Washington, located in Seattle, Washington.[62] The data is compiled based on the aid statistics on official development assistance for the health sector, provided by the Development Assistance Committee (DAC) of the Organization for Economic Co-operation and Development (OECD). The data covers a maximum of 160 recipient countries and dependent territories, and 22 donors between 1990 and 2007.[63,64] The database includes recipient countries that are classified as de facto dependent areas (see Appendix A). The donors included are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

DAH is defined as "financial and in-kind contributions made by channels of development assistance to improve health in developing countries. It includes all disease-specific contributions as well as general health sector support, and excludes support for allied sectors." (IHME (2009), 13). The definition does not explicitly exclude humanitarian aid, which is unfortunate because it presumably has a different purpose, since it is meant to alleviate immediate needs of all kinds, caused by disasters and emergencies. However, the inclusion does not necessarily constitute a problem for two reasons. First, the decision-making process of humanitarian aid is not influenced only by humanitarian need, but also bilateral, especially political, factors (Fink and Redaelli (2011)). Hence, humanitarian aid seems not to be systematically different but to follow similar rules as other foreign aid. Second, although not explicitly stated, it is very likely that the data exclude humanitarian aid, since the dataset is based on OECD data, which usually distinguishes between humanitarian and foreign aid.

In an attempt to model the donors' decision-making process in the most accurate way possible, missing observations have been replaced by the last available observation of the variables Economic Freedom, Government Effectiveness, Corruption Perception Index and DTP3.[65] A donor can only use available data in the decision-making process. For instance, in the selection decision in 1993, only data

[62] The data has been publicly accessible since December 2009. A more recent version contains data for 2008, but only for a handful of recipient countries. When last checked, data for 2009 and 2010 was only based on estimations. Therefore, no more recent data has been included in this analysis.

[63] The dataset provides 63,360 potential observations (160 recipients*22 donors*18 years) of which 14,599 are strictly positive, given that not all donors allocate aid to all recipients in all years.

[64] Since we focus here on donor-recipient aid flows, the regional respectively multi-country aid flows presented in the IHME database are ignored.

[65] Please note that no other data has been interpolated.

on economic freedom from 1990 could be used. This is a clear argument against extrapolation to fill missing observations. For some countries, the official data reported for the prevalence of HIV starts with missing values but reports a HIV prevalence of 0.1 percent in the following years. In these cases, the missing values were replaced by zeros.

*Limitations*

The present comprehensive data on health assistance does not provide any information on the regional distribution of DAH. Consequently, it is impossible to draw any conclusions of how well poor and sick people are targeted in the receiving country. In addition, the available data does not allow for any conclusion on the recipient's choices. It is unclear to what extent a receiving country did not receive DAH because it was *not* selected by the respective donor or to what extent the recipient *rejected* the respective donor. Such a distinction could potentially be important for country dyads with a common colonial past. A former colony could be either susceptible to aid flows from its colonizer, or reserved against any attempt to influence the national policies given the past. Finally, the non-selection of a recipient has two possible explanations. The country was either purposely rejected for some reason or could not be included due to a small share reserved for health issues within a donor's aid budget in a given year. It is not possible to discriminate between these two possibilities in the present analysis.

The database includes negative DAH figures representing funds that were returned from recipient organizations back to their donors for two major reasons. First, a donor may make a disbursement that exceeds the original amount of the grant and the difference is later returned to the donor. Second, a recipient may receive funds that it ultimately does not use. These funds are returned to the donor and are often available to be disbursed later in the grant.[66] Since negative net (DAH) disbursements "do not and cannot arise from a conscious decision of the donor to allocate a negative amount to a given country" (McGillivray (2003b), 177, fn. 10), they are not taken into consideration in the analysis.

## 5.2. Stylized facts on the decision-making process

The literature on the allocation of foreign aid portrays the traditional Western bilateral donors as a heterogeneous group. Some donor countries have a relatively big aid budget and hence allocate large amounts of foreign aid often to many recipient countries, while the larger group of bilateral donors has smaller aid budgets and allocates smaller shares of foreign aid often to fewer recipients. Looking at health assistance, we observe a similar pattern for both the selection and allocation decisions. As shown in Table 4, five donor countries (US, France, Italy, Japan, UK) take 40 percent of all selection decisions, which corresponds to two thirds of the total budget of health assistance. The simple statistic reveals remarkable differences among individual donors. The US accounts for one out of ten selection

[66] Personal communication with Ms Katie Leach-Kemon, Data Development Manager at the Institute for Health Metrics and Evaluation, University of Washington on December 3, 2010.

decisions but for four out of ten allocation decisions, which suggests that many countries are selected and are allocated relatively large shares. France and Italy, however, account for almost as many selection decisions but for only a small share of allocation decisions. This suggests that they select many recipients but allocate relatively small shares of health assistance. The UK, Japan, Germany, Spain and France account for a third of allocated health assistance. The remaining 16 donors allocate less than a third of total health assistance. The last three columns of Table 4 present figures on official development assistance (ODA) for comparison. The US and Japan are the bilateral donors that allocate the most aid. These two donors account for one fifth each, comparing to the total ODA provided by all bilateral OECD donors. The second biggest donors are France and Germany, which each account for a share of more than ten percent of the total ODA. The UK and the Netherlands each provide around about five percent of the ODA. The comparison shows that, in general, the donors with the largest ODA budget are also the most important providers of development assistance but with a slightly different ranking.

Table 4. Aggregate selection and allocation decisions by individual donors, 1990-2007

| | *DAH* | | | | | | *ODA* | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Selection** | | | **Allocation** | | | **Allocation** | | |
| Donor | Number of countries | in % | in % (cumulative) | in thousand US$ | in % | in % (cumulative) | in thousand US$ | in % | in % (cumulative) |
| US | 1,354 | 9.27% | 9.3% | 14,300,000 | 40.1% | 40.1% | 220,489,830 | 22.2% | 22.2% |
| France | 1,258 | 8.62% | 17.9% | 1,500,000 | 4.2% | 44.3% | 114,927,190 | 11.6% | 33.8% |
| Italy | 1,181 | 8.09% | 26.0% | 832,000 | 2.3% | 46.6% | 26,754,440 | 2.7% | 36.5% |
| Japan | 1,058 | 7.25% | 33.2% | 3,280,000 | 9.2% | 55.8% | 209,099,690 | 21.1% | 57.6% |
| UK | 930 | 6.37% | 39.6% | 3,910,000 | 11.0% | 66.7% | 63,502,660 | 6.4% | 64.0% |
| Belgium | 906 | 6.21% | 45.8% | 698,000 | 2.0% | 68.7% | 13,602,340 | 1.4% | 65.4% |
| Netherlands | 894 | 6.12% | 51.9% | 1,490,000 | 4.2% | 72.9% | 49,360,340 | 5.0% | 70.4% |
| Norway | 885 | 6.06% | 58.0% | 862,000 | 2.4% | 75.3% | 21,682,610 | 2.2% | 72.6% |
| Germany | 859 | 5.88% | 63.9% | 1,980,000 | 5.5% | 80.8% | 105,136,840 | 10.6% | 83.2% |
| Canada | 677 | 4.64% | 68.5% | 723,000 | 2.0% | 82.8% | 32,144,180 | 3.2% | 86.4% |
| Sweden | 671 | 4.60% | 73.1% | 1,210,000 | 3.4% | 86.2% | 28,937,730 | 2.9% | 89.3% |
| Spain | 645 | 4.42% | 77.5% | 1,300,000 | 3.6% | 89.9% | 23,943,610 | 2.4% | 91.7% |
| Finland | 523 | 3.58% | 81.1% | 280,000 | 0.8% | 90.7% | 6,320,430 | 0.6% | 92.4% |
| Denmark | 517 | 3.54% | 84.6% | 854,000 | 2.4% | 93.0% | 19,641,060 | 2.0% | 94.4% |
| Australia | 498 | 3.41% | 88.1% | 956,000 | 2.7% | 95.7% | 17,676,050 | 1.8% | 96.1% |
| Switzerland | 426 | 2.92% | 91.0% | 393,000 | 1.1% | 96.8% | 14,946,210 | 1.5% | 97.7% |
| Ireland | 383 | 2.62% | 93.6% | 502,000 | 1.4% | 98.2% | 4,076,530 | 0.4% | 98.1% |
| Austria | 344 | 2.36% | 96.0% | 280,000 | 0.8% | 99.0% | 9,414,150 | 0.9% | 99.0% |
| Greece | 186 | 1.27% | 97.2% | 46,400 | 0.1% | 99.1% | 1,528,610 | 0.2% | 99.2% |
| New Zealand | 178 | 1.22% | 98.5% | 46,400 | 0.1% | 99.3% | 2,130,420 | 0.2% | 99.4% |
| Luxembourg | 165 | 1.13% | 99.6% | 184,000 | 0.5% | 99.8% | 1,752,630 | 0.2% | 99.6% |
| Portugal | 61 | 0.42% | 100.0% | 75,600 | 0.2% | 100.0% | 4,322,350 | 0.4% | 100.0% |
| Total | 14,599 | 100% | | 35,702,400 | 100% | | 991,389,900 | 100.0% | |

*Source:* IHME (2009), OECD (2011). Please note that the allocation figures on health assistance are in constant 2007 US dollars, while the ODA allocation figures are in current prices. (Alternatively, the figures could have been shown in constant 2009 US dollars.).

Table 5 presents which recipient countries were most often and least often selected between 1990 and 2007, the years for which data on health assistance is available. The most striking fact about the list of top selected recipients is the heterogeneity as regards the population size. India and Bangladesh are among the most populous countries in the world, while all other top selected recipients have a rather small population. India, the world's second most populous country, was chosen as recipient as often as Nicaragua, a country with a relatively small population. The least often recipients of health assistance are all small island states. Four of them are de facto dependent areas (Wallis and Futuna of France, Netherlands Antilles of the Netherlands, Northern Mariana Islands of the US and Tokelau of New Zealand). Bahrain, Barbados, Malta are outliers because they were classified as high income country during some years between 1990 and 2007. The ranking of top and bottom selected recipients is similar to rankings of allocation receipts. Populous countries are at the top of the list, while small island states are predominantly at the bottom of the list. Six of the most often selected recipients are located in sub-Saharan Africa.

Table 5. Top selected recipients and bottom selected recipients, 1990-2007

| Recipient | Number of times selected | Population 2007 | Recipient | Number of times selected | Population 2007 |
|---|---|---|---|---|---|
| Kenya | 259 | 37,800,000 | Wallis & Futuna | 7 | 17,000 |
| Tanzania | 259 | 41,300,000 | St. Vincent & the Grenadines | 6 | 110,000 |
| Uganda | 257 | 30,600,000 | Antigua & Barbuda | 5 | 86,000 |
| Mozambique | 255 | 21,900,000 | Nauru | 5 | 13,000 |
| Bangladesh | 250 | 158,000,000 | Barbados | 4 | 260,000 |
| India | 240 | 1,120,000,000 | Malta | 4 | 409,000 |
| Nicaragua | 236 | 5,600,000 | Netherlands Antilles | 4 | 192,000 |
| Vietnam | 230 | 85,200,000 | Northern Mariana Is. | 4 | 84,000 |
| Zimbabwe | 229 | 12,500,000 | Bahrain | 3 | 760,000 |
| Ethiopia | 220 | 78,600,000 | Tokelau | 3 | 1,760 |
| Total | 2,435 | | Total | 45 | |

*Source:* IHME (2009).

Table 6 lists the top recipients of health assistance between 1990 and 2007. On the left-hand side, the countries are presented which received most health assistance in terms of the total amount. India, with the world's second largest population, was the top recipient. Indonesia, Bangladesh and Nigeria are also among the most populous countries in the world. All other top recipients, however, have rather small populations. For instance, Tanzania received two thirds of the amount allocated to India but has only 4% of the Indian population. The relation between receipt of health assistance and population is similar for Kenya, Mozambique and Uganda. Zambia received half as much health assistance as India but has 1% of the Indian population. Nigeria, the most populous African country, received almost half the amount of health assistance for India, but with roughly a tenth of the population. On the right-hand side, the countries with the highest per capita receipt of health assistance are listed. Mayotte, as a de facto dependent territory of France, leads the list. Palau, as de facto dependent territory of the US, received the fourth highest per capita health assistance. In general, small islands states and small countries received most health assistance per capita. Suriname, in South America, and Namibia, in Africa, are the only continental countries of the list. Iraq and the Occupied Palestinian Territory seem to be outliers because they were involved in conflicts during that period. The ranking of health assistance resembles rankings known from the foreign aid literature: First, relatively populous countries are at the top of the list, while small island states dominate the bottom of the list. Second, six the top ten recipient countries are located in sub-Saharan Africa.

Table 6. Top recipients of development assistance for health (DAH), 1990-2007

| Recipient | DAH receipts (US$) | Population 2007 | Recipient | DAH receipts (US$ per capita) | Population 2007 |
|---|---|---|---|---|---|
| India | 47,700,000 | 1,120,000,000 | Mayotte | 48,691 | 186,000 |
| Tanzania | 30,200,000 | 41,300,000 | Marshall Is. | 18,584 | 58,000 |
| Bangladesh | 29,500,000 | 158,000,000 | Micronesia | 9,501 | 110,000 |
| Kenya | 29,200,000 | 37,800,000 | Palau | 7,551 | 20,200 |
| Mozambique | 28,800,000 | 21,900,000 | Kiribati | 3,582 | 95,000 |
| Uganda | 27,900,000 | 30,600,000 | Sao Tome & Principe | 3,005 | 158,000 |
| Indonesia | 27,100,000 | 225,000,000 | Palestinian Territory | 2,894 | 3,800,000 |
| Zambia | 23,900,000 | 12,300,000 | Suriname | 2,655 | 510,000 |
| Nigeria | 20,900,000 | 148,000,000 | Tonga | 2,480 | 103,000 |
| Iraq | 20,500,000 | 29,900,000 | Namibia | 2,265 | 2,100,000 |

*Source:* IHME (2009), UN Statistics Division (2010), World Bank (2010), CIA (2010). Please note that all figure on DAH receipts are in constant 2007 US dollars.

Table 7 summarizes the selection and allocation decisions by major, like-minded and small donors. Out of 160 potential recipients, the donor selects between 7 and 143 receiving countries. Comparing the individual selection decisions of all donors, the bilateral donors select between a minimum of 7 recipient countries, in the case of Portugal, and maximum of 143 potential recipients in the case of Japan.[67] Summing the choices from 1990 till 2007, the donors made between 61 choices, in the case of Portugal, and 1,354 choices in the case of the US. On average, a donor selects around about 37 recipients per year.

Table 7. Aggregate selection and allocation decisions of donors in the sample, 1990-2007

| | **Selection** | | **Allocation** | | | | |
|---|---|---|---|---|---|---|---|
| Donor | No. of recipients | Total no. selections | Mean | Median | Minimum | Maximum | Standard deviation |
| *Major donors* | | | | | | | |
| France | 123 | 1,258 | 1,428,123 | 394,559 | 0.16 | 45,900,000 | 3,390,448 |
| Germany | 105 | 859 | 2,636,010 | 949,409 | 790.74 | 56,500,000 | 5,252,742 |
| Japan | 143 | 1,058 | 3,680,954 | 1,248,256 | 202.27 | 91,900,000 | 6,699,620 |
| Spain | 94 | 645 | 2,343,768 | 733,470 | 958.25 | 41,800,000 | 4,542,145 |
| UK | 93 | 930 | 4,725,192 | 506,804 | 29.62 | 217,000,000 | 12,700,000 |
| US | 114 | 1,354 | 12,000,000 | 5,233,545 | 42.80 | 411,000,000 | 23,800,000 |
| *Like-minded donors* | | | | | | | |
| Canada | 104 | 677 | 1,195,258 | 389,848 | 217.52 | 27,500,000 | 2,735,011 |
| Denmark | 55 | 517 | 1,985,094 | 373,492 | 30.88 | 23,900,000 | 3,793,301 |
| Netherlands | 101 | 894 | 1,941,883 | 498,435 | 106.67 | 28,900,000 | 3,640,256 |
| Norway | 92 | 885 | 1,116,874 | 311,208 | 697.88 | 21,200,000 | 2,377,223 |
| Sweden | 99 | 671 | 2,148,278 | 533,719 | 234.71 | 32,000,000 | 3,857,965 |
| *Small donors* | | | | | | | |
| Australia | 58 | 498 | 2,185,897 | 373,416 | 131.80 | 49,100,000 | 6,284,815 |
| Austria | 70 | 344 | 993,525 | 65,031 | 657.38 | 56,100,000 | 4,150,935 |
| Belgium | 98 | 906 | 871,784 | 181,104 | 23.75 | 24,000,000 | 2,047,822 |
| Finland | 76 | 523 | 647,004 | 140,993 | 384.18 | 8,513,266 | 1,299,826 |
| Greece | 52 | 186 | 266,027 | 82,888 | 1,134.30 | 8,464,752 | 868,612 |
| Ireland | 85 | 383 | 1,402,990 | 164,158 | 1,148.26 | 29,900,000 | 3,366,599 |
| Italy | 106 | 1,181 | 883,938 | 229,042 | 65.70 | 21,500,000 | 1,861,130 |
| Luxembourg | 62 | 165 | 1,195,652 | 475,967 | 1,223.92 | 8,813,473 | 1,587,107 |
| New Zealand | 32 | 178 | 277,392 | 100,053 | 476.81 | 5,012,697 | 632,208 |
| Portugal | 7 | 61 | 1,366,101 | 808,905 | 9,771.95 | 4,269,038 | 1,290,741 |
| Switzerland | 74 | 426 | 1,085,250 | 322,800 | 1,666.94 | 13,100,000 | 1,767,909 |

*Source:* IHME (2009). Please note that all allocation figures are in constant 2007 US dollars.

The statistics on the individual allocation decision illustrate the heterogeneity of bilateral donors in terms of health assistance. The average of the allocated aid ranges from $266,000 to $12 million. The US allocated the biggest aid shares, on average $12 million. The second largest allocations were made

[67] Portugal appears to have a unique and simple selection pattern. It chose only among the seven countries with Portuguese as official language when selecting recipients for health assistance: Angola, Brazil, Cape Verde, Guinea-Bissau, Mozambique, Sao Tome and Principe and Timor-Leste.

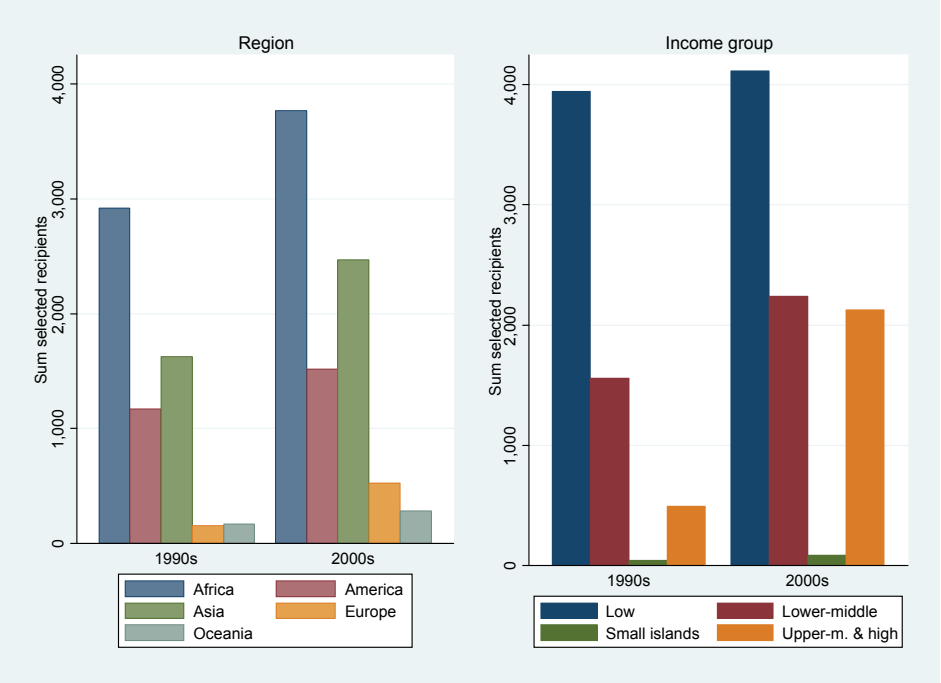
by the UK, on average almost $5 million. The other major donors allocated between $1.5 and almost $4 million. The like-minded donors provided between $1.1 and $2.2 million of health assistance on average. The range of average allocations made by small donors starts with roughly a quarter million dollars, in the case of Greece or New Zealand, and ends with almost $2.2 million in the case of Australia. As far as the average amounts are concerned, there is little difference between many small donors and the like-minded donors.

As indicated by the average amounts, the smallest minimum amount of health assistance allocated France with 16 cents. Portugal provided the greatest minimum amount with almost $10,000. The smallest maximum allocation by a single donor was $4.2 million in the case of Portugal. The US provided the largest maximum amount with $411 million.

### 5.2.1. Stylized facts on the country selection

In examining the selection decisions, first, all donors are considered taken together and then individual donors are looked at, but grouped into major, like-minded and small donors.[68] Figure 8 depicts the selection decisions by the average donor with respect to decade, region and income group.[69] In comparison, more recipients are selected in the second decade, although it is comprised of the years 2000 till 2007, a shorter time period than the first decade from 1990 till 1999. In both decades, most selected countries are on the African continent, while the Asian continent accounts for the second largest percentage.

Figure 8. Selection decisions per decade, region and income group, 1990-2007




*Source:* IHME (2009).

In both decades, most of the selected countries are low income or lower-middle income countries. At all times, however, upper-middle income countries are selected as recipients as well. The number of upper-middle income countries is almost as high as the number of lower-middle income countries, and half the number of low income countries. This is somewhat at odds with the familiar donor's claim to

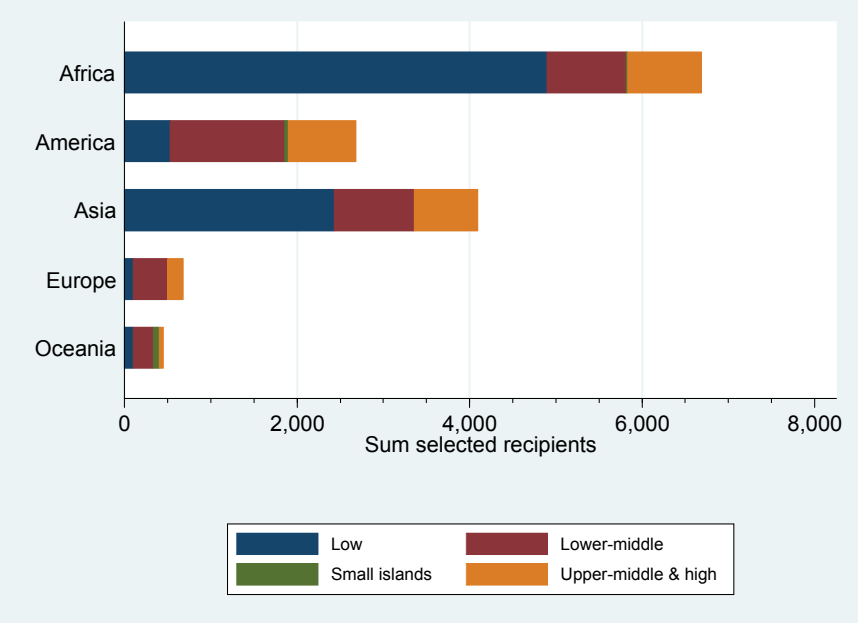
[68] The major donors are France, Germany, Japan, Spain, the UK and the US. Like-minded donors are Canada, Denmark, the Netherlands, Norway and Sweden. Small donors are Austria, Australia, Belgium, Finland, Greece, Ireland, Italy, Luxembourg, New Zealand, Portugal and Switzerland. Please refer to chapter 7.3 for the definition of each donor group.

[69] The recipient countries are classified according to the group definitions established by the World Bank. Economies are divided according to 2009 GNI per capita (low income, $995 or less; lower middle income, $996 - $3,945; upper middle income, $3,946 - $12,195; and high income, $12,195 or more). Please note that this classification is only available for World Bank member countries and all other economies with population of more than 30,000. Therefore, the small islands Anguilla, Cook Is., Falkland Is., Montserrat, Nauru, Niue, St. Helena, Tokelau, Turks & Caicos Is., Tuvalu and Wallis & Futuna are separately grouped as small islands. Their inclusion enables a broader perspective on and illustrates the heterogeneity of selection and allocation decisions.
For expositional purposes, the categories upper-middle income and high income are summarized under upper-middle and high income.

be oriented to recipient need, suggesting the preferential selection of low and lower-middle income countries. Apparently, not only the income level of the recipient, but also other aspects influence, on average, the selection decisions for health assistance.

Figure 9 illustrates where selected recipients are geographically located, distinguished with respect to their income group. The recipients selected on the African and Asian continent account for two thirds of all selection decisions. The great majority of selected African and Asian countries are low income and lower-middle income countries. In North and South America, the majority of selected recipients belong to the lower-middle and upper-middle income group. The focus in Europe is on lower-middle and upper-middle income countries.

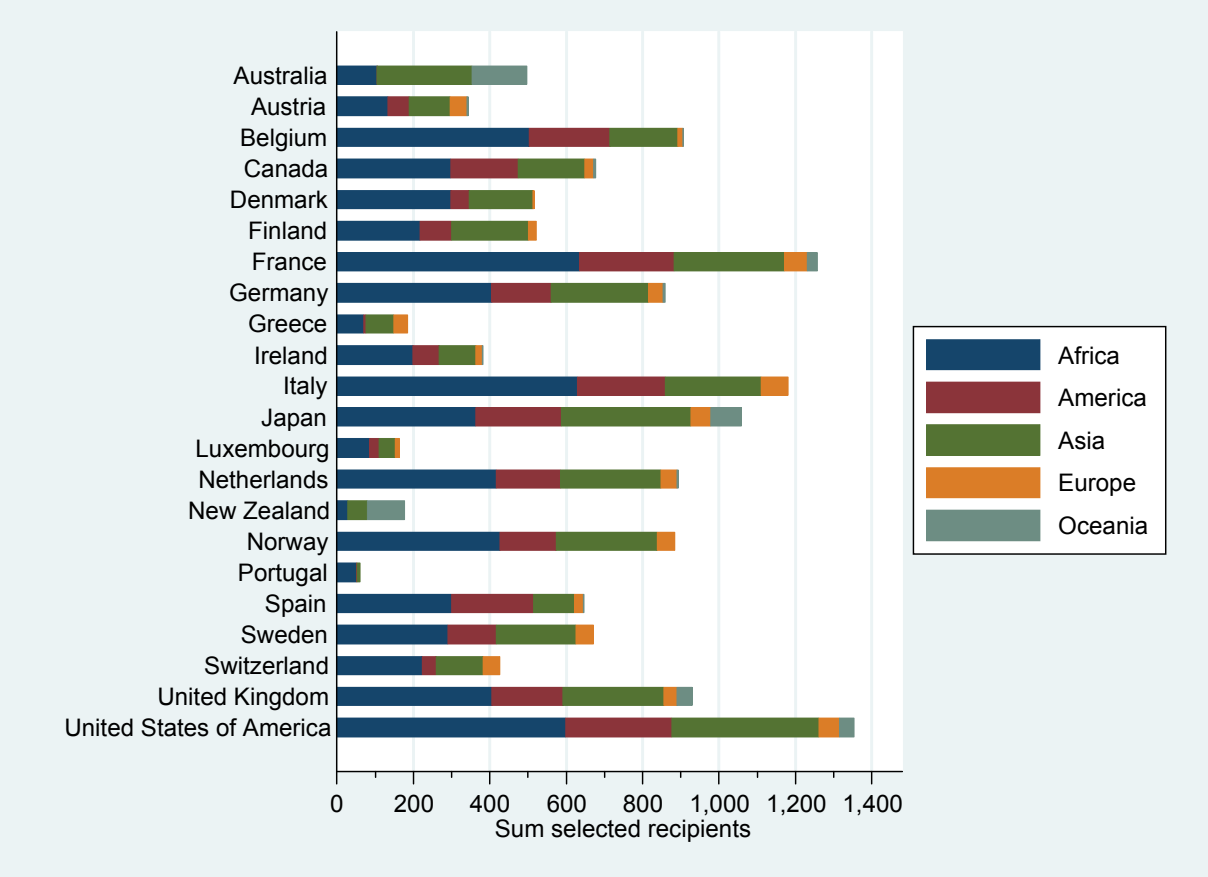
Figure 9. Selection decisions per region and income category, 1990-2007




*Source:* IHME (2009).

Figure 10 shows the selection decisions of bilateral donors, separated into the geographical location of the recipient. As has been commented on before, France, Italy, Japan, the UK and the US account for most selection decisions. The bar diagram also illustrates the heterogeneity of the selection pattern among individual bilateral donors as regards the different continents. Most donors select relatively more African countries. Australia, Japan and New Zealand select the majority of their recipients on the Asian continent and in Oceania. Basically all other donors select the biggest share of recipients on the African continent.

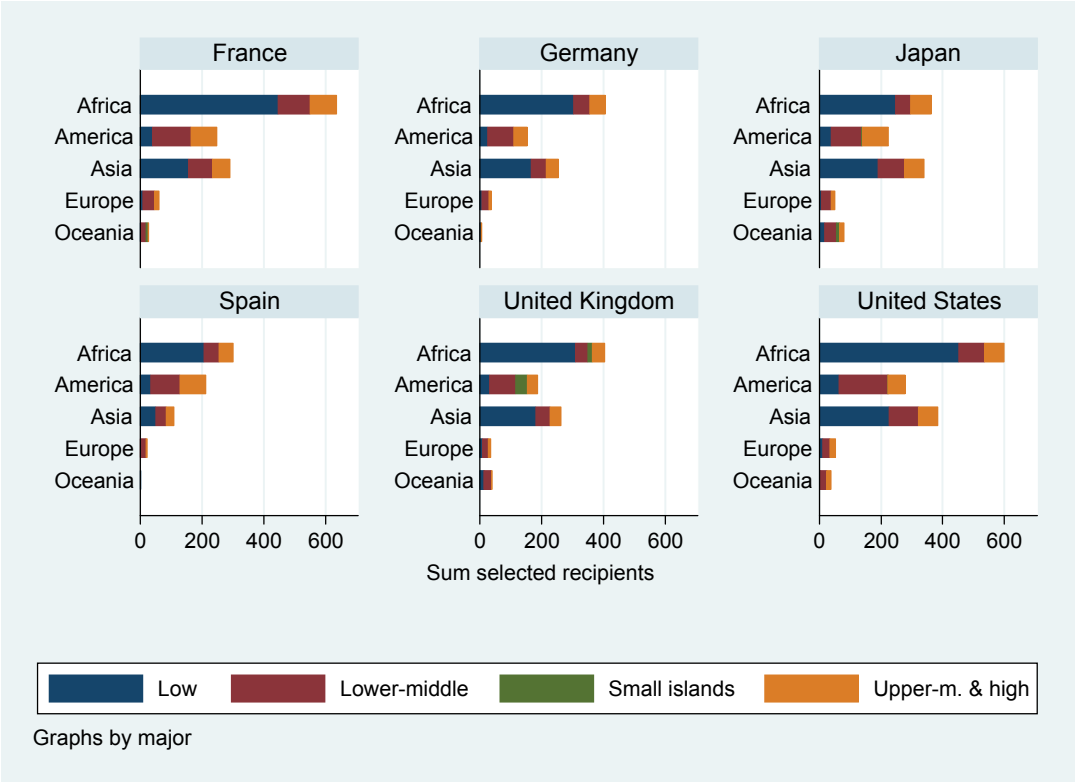
Figure 10. Overview of selection decisions of bilateral donors per region, 1990-2007




*Source:* IHME (2009).

The overall pattern of selection decisions disguises the substantial variations among individual donors. Figure 11 shows the selection decisions of major donors per continent and per income group of the recipient countries. All major donors select most of their recipients on the African continent, of which the clear majority are low income countries. All major donors, except Spain, select Asian countries second most often, mainly low income Asian countries. As regards the North and South American continents, lower-middle and upper-middle income countries are most often chosen. Japan selects relatively many countries located in Oceania, while Germany and Spain do not select any country in Oceania. The UK selects many islands states in the Americas and Africa as recipients. If we expected to observe a regional bias in favor of the own continent where the respective major donor is locate, no regional bias can be observed for any major donor based on these bar diagrams; with the slight exception of Japan.

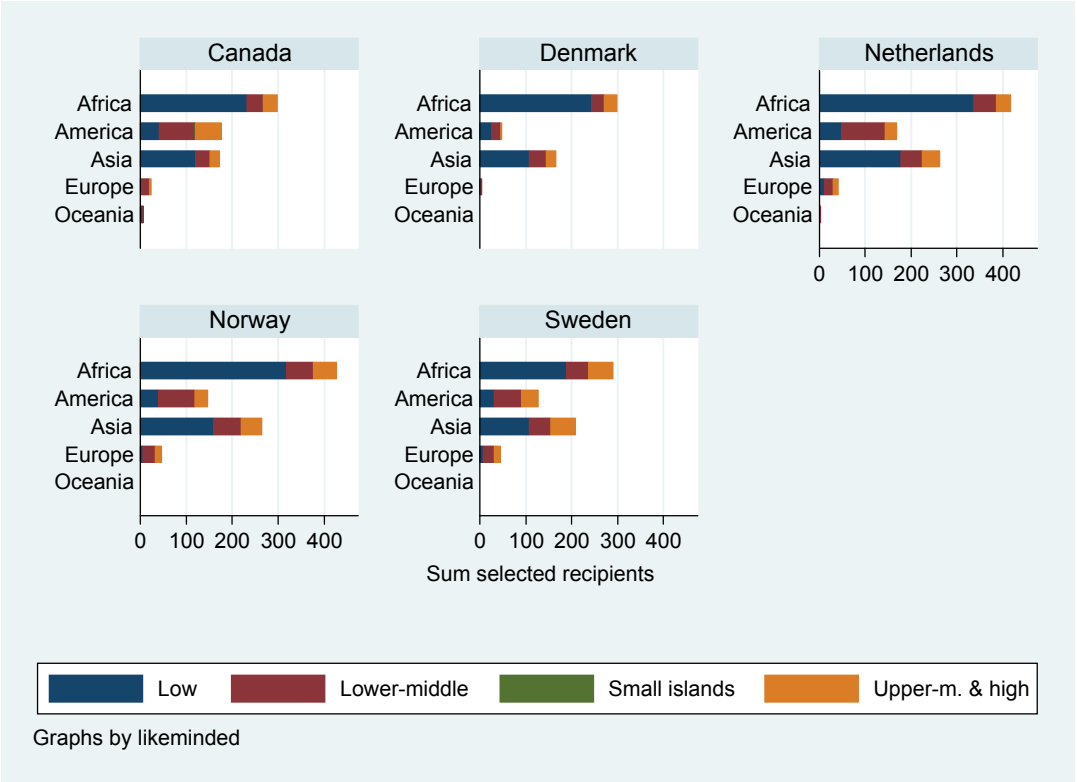
Figure 11. Selection decisions of major donors, 1990-2007




*Source:* IHME (2009).

Figure 12 illustrates the selection decisions of like-minded donors with respect to the geographic location and the income level of the recipient country. All like-minded donors select most of their recipients on the African continent. Asian countries account for the second largest number of selection decisions by like-minded donors. Only Canada selects recipients located in Oceania. The focus on low income countries is particularly visible regarding the African continent, but it is also observable for Asian recipient countries. Despite this clear focus, it is surprising to see like-minded donors selecting some upper-middle income countries. This appears slightly at odds with the postulate about their primary focus on the recipient need.

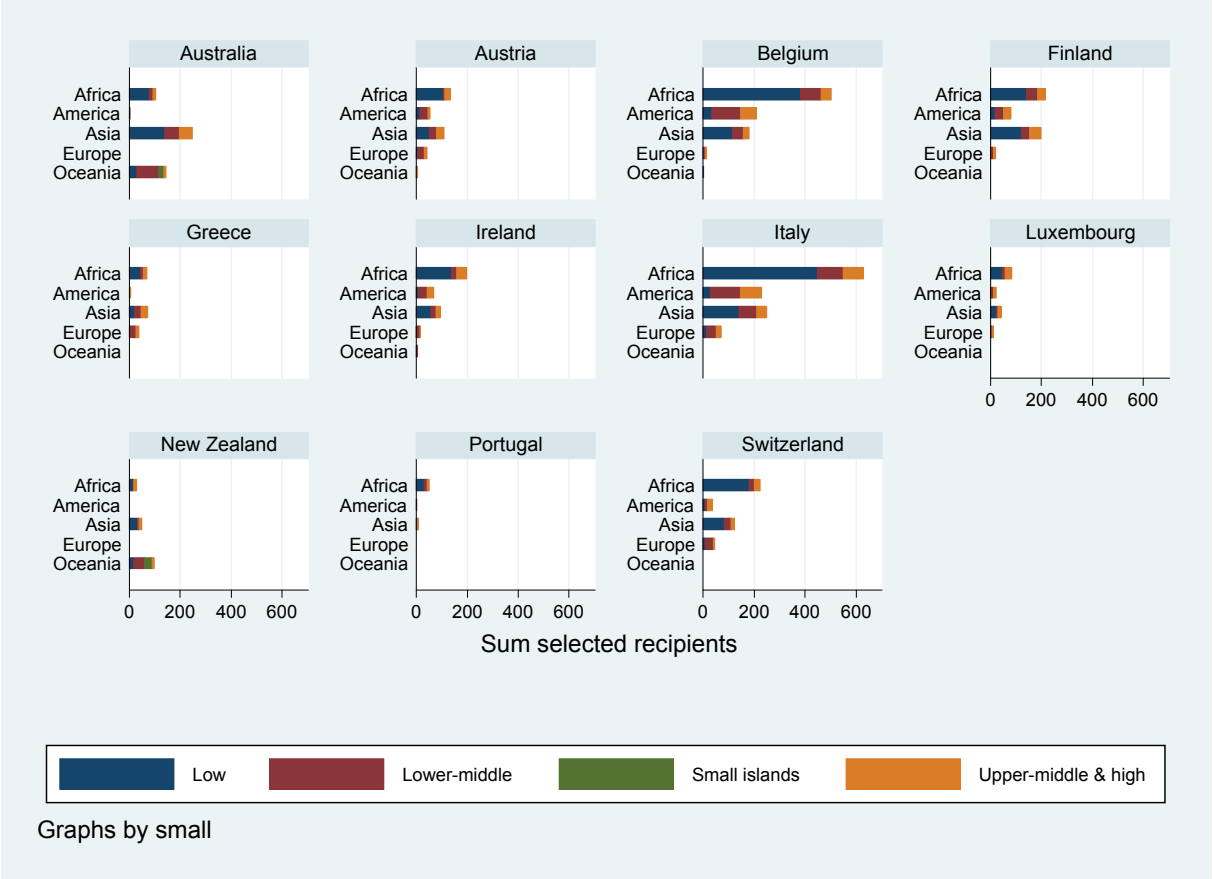
Figure 12. Selection decisions of like-minded donors, 1990-2007




*Source:* IHME (2009).

Figure 13 depicts the selection decisions of small donors, as regards the income level, respective to the geographic location of the recipient country. Italy and Belgium select the great majority of recipients on the African continent, with a pronounced focus on low income countries. Both of these donors select many more recipients than all other small donors. Australia and New Zealand select the majority of their recipients in Asia and Oceania, while European small donors select most of their recipients on the African continent, but also from all other continents except in Oceania.

Figure 13. Selection decisions of small donors, 1990-2007

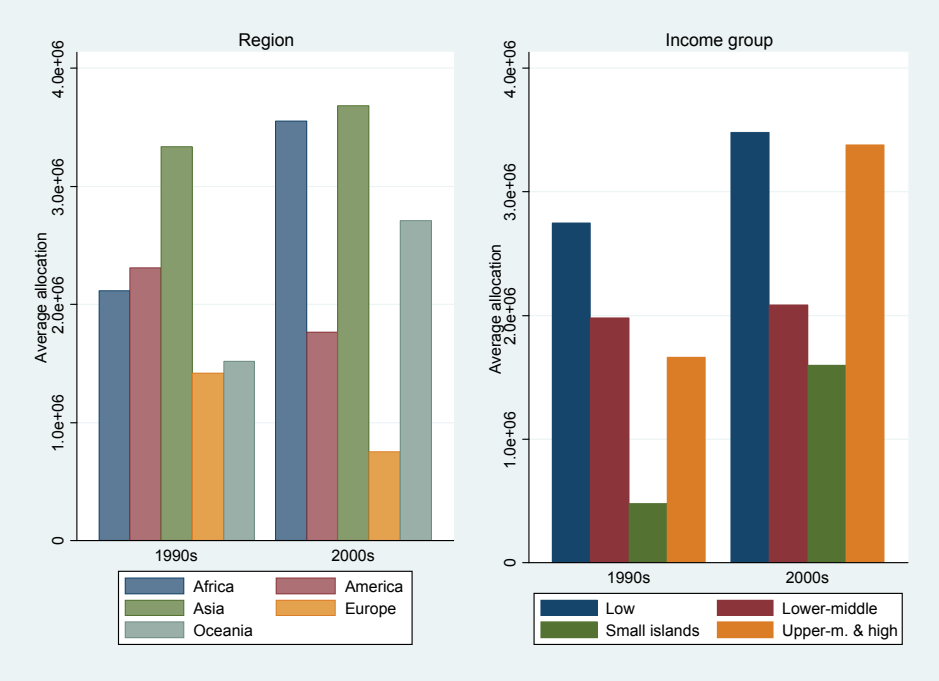



*Source:* IHME (2009).

### 5.2.2. Stylized facts on the allocation decision

The allocation decisions of the average donor are examined first, and then selected donors are looked at individually. Figure 14 depicts the allocation decisions by the average donor with respect to decade, region and income group. In both decades, most aid was allocated to the African continent. On average, the allocations made in the second decade are greater than in the first decade. Particularly, the average shares allocated to Africa and Oceania increased in the years 2000 to 2007. In the first decade, greater aid shares were provided to low and lower-middle income countries on average, while in the second decade, low and upper-middle income countries received the greatest average allocations. In light of the prominent role that upper-middle income countries play in receipt of allocations, it seems likely that factors other than recipient's need influence the allocation decisions of the average donor.

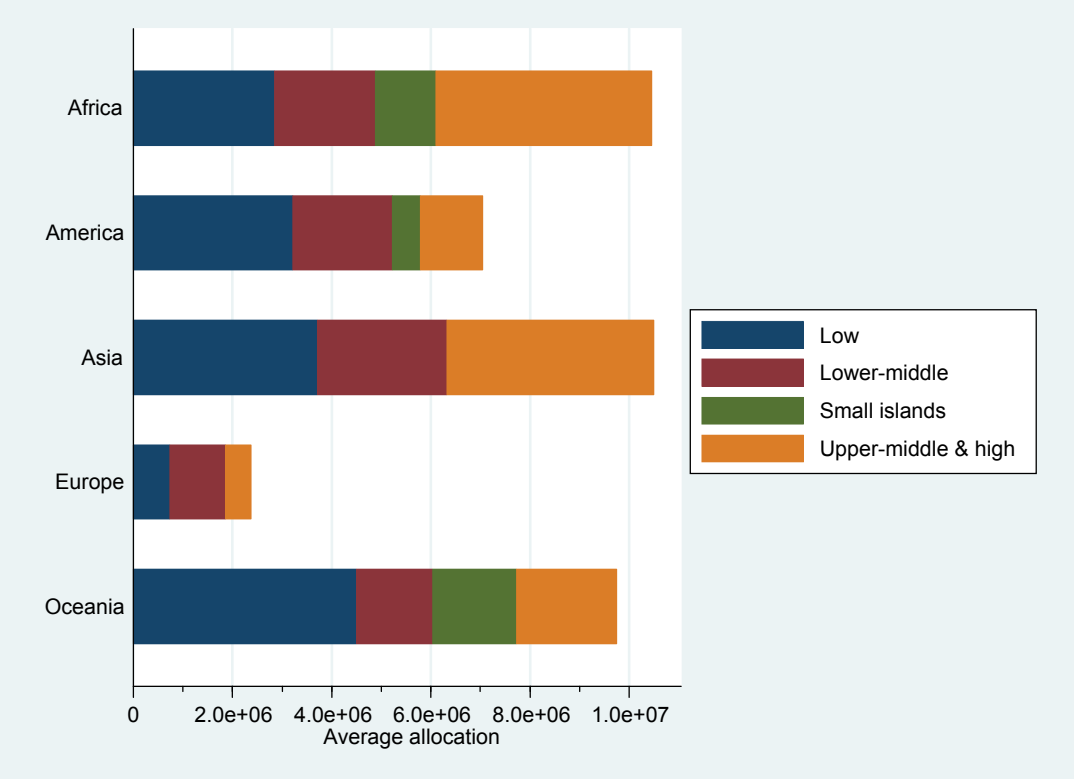
Figure 14. Allocation decisions per decade, region and income group, 1990-2007




*Source:* IHME (2009). Please note that average allocations are in constant 2007dollars.

Figure 15 illustrates average allocations per continent and income group. On average, the allocations to Africa, Asia and Oceania have the same size. Small islands receive large average allocations. Low income countries are allocated roughly the same average amount as are upper-middle income countries.

Figure 15. Allocation decisions per region and income category, 1990-2007



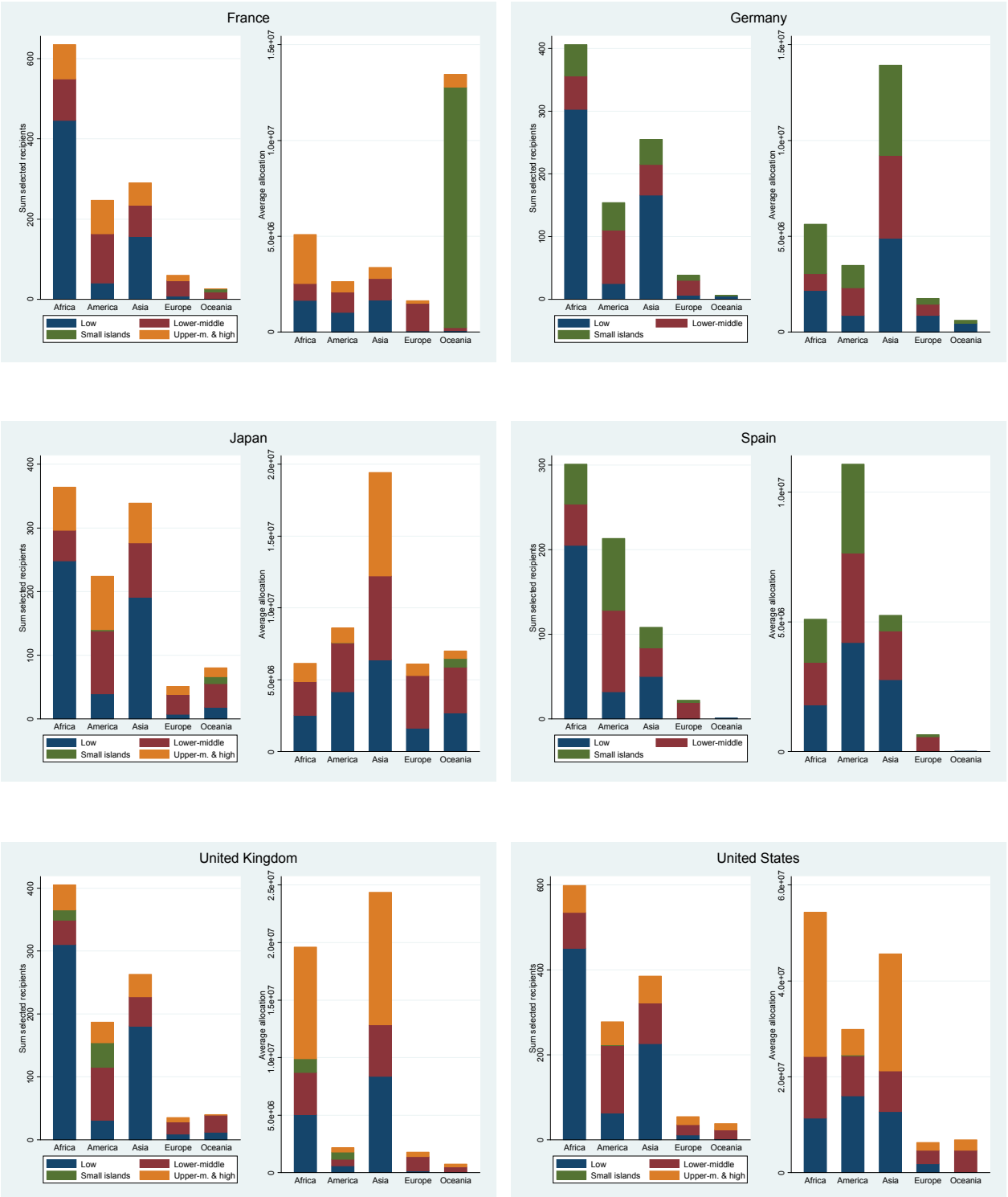

*Source:* IHME (2009). Please note that average allocations are in constant 2007dollars.

Since the aggregate figures represent the overall pattern of allocation decisions but mask the substantial variation among donors, Figures 16 and 17 depict the selection and allocation decisions of major and like-minded donors, as the most important bilateral donors, per region and income group. The majority of all selected recipients are countries on the African continent for both major and like-minded donors. The second most often selected region is Asia, with the exception of Spain and Canada that give preference to recipients on the American continent. Denmark, Norway and Sweden did not select any country from Oceania as a potential recipient. Of the major donors, Germany and Spain did not select any upper-middle income country as recipient. Except Canada, no like-minded donor selected any upper-middle income country.

On average, France allocated more health assistance to small islands in Oceania than to the African continent, which can be explained by the overseas dependent areas in Oceania, listed in Appendix A. Germany, the UK and Japan allocated, on average, more health assistance to Asia; the first to low and lower-middle income countries, the latter two more to upper-middle income countries. Spain allocated on average more health assistance to the American continents, while the US provided, on average, more health aid for African countries, but with a relatively large share to upper-middle income countries. Germany and Spain provided, on average, relatively large allocation shares to small islands.

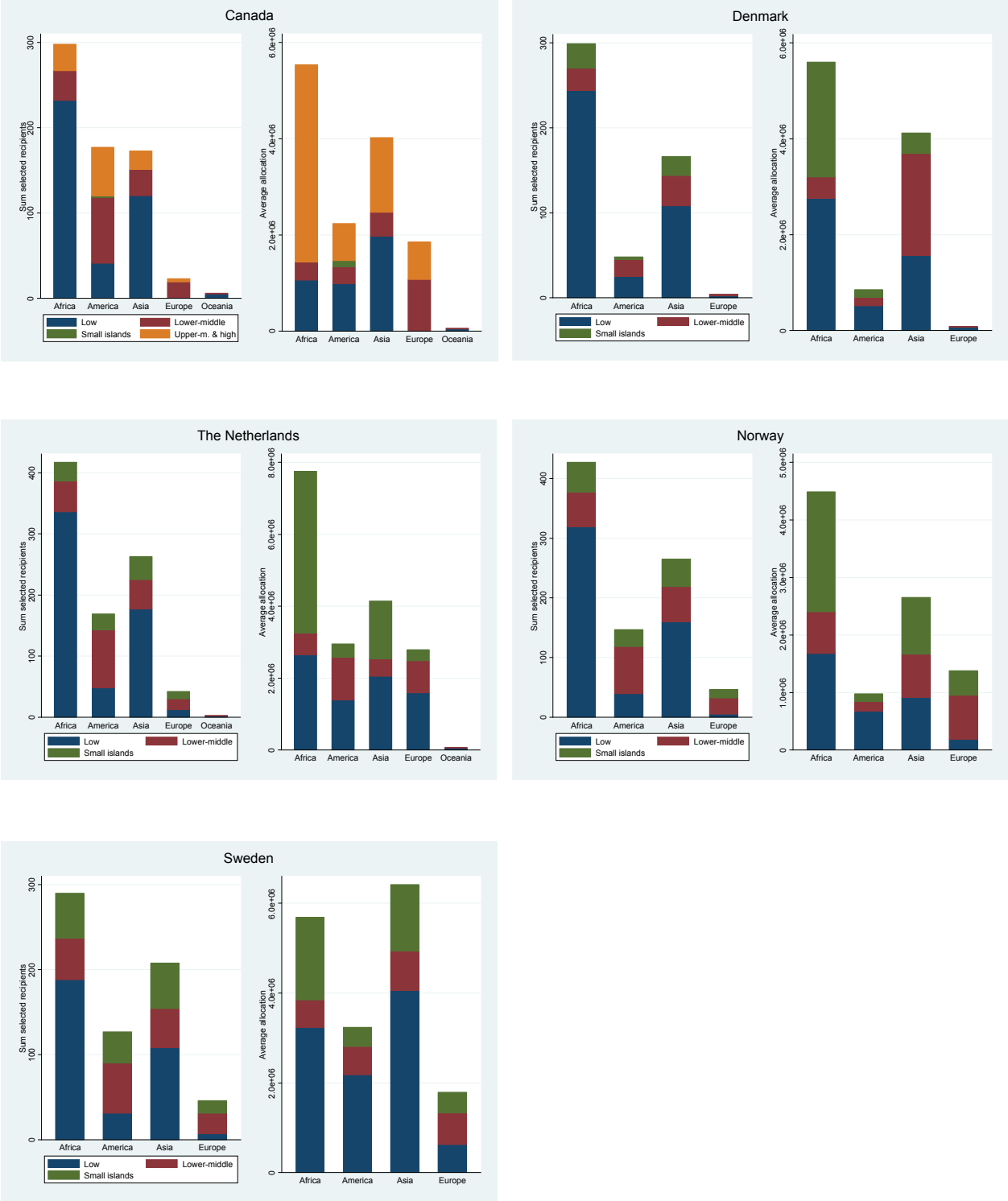
All like-minded donors allocated, on average, most aid to Africa, except Sweden that allocated most aid to Asia. All like-minded donors allocated, on average, large shares to small islands, with the exception of Canada. Canada, in turn, provides on average large allocations to upper-middle income countries.

Figure 16. Selection and average allocation decisions of major donors, per region and income group, 1990-2007




*Source:* IHME (2009). Please note that average allocations are in constant 2007 dollars.

Figure 17. Selection and average allocation decisions of like-minded donors, per region and income group, 1990-2007




*Source:* IHME (2009). Please note that average allocations are in constant 2007 dollars.

### 5.2.3. Concluding remarks

In summary, most donors selection and allocation decisions seem to reflect a multidimensional decision-making process rather than a narrow focus on recipient need. The decisions vary considerably among individual donors and across donor groups. In the remainder of this discussion, we will examine whether the decision-making process for health assistance has been guided by health indicators or if not, which other factors have been driving the selection and allocation decisions of the average donor respectively the single bilateral donor.

# Chapter 6
# Econometric thoughts on modeling the decision-making process

## 6.1. Introductory remarks

The allocation of aid is the result of a two-step decision-making process.[70] The donor first selects the potential recipient, and then decides how much aid to grant to each of them (Dudley and Montmarquette (1976), 136-137). Consequently, aid allocation is only the visible part of the two-fold decision-making process. As commented on in the literature review, most studies do not explicitly distinguish the selection stage from the allocation stage, nor do they analyze the factors that increase the selection probability. The missing distinction implies that the determinants motivating the selection of a country are assumed to be identical with those underlying the allocation of aid in a selected country. The modeling of the aid process needs to account for the two stages in the decision-making process.

Most econometric studies on aid allocation are based on the difference between recipient need and donor interest. The donor interest reflects purely their own economic, political and strategic interests, while the concept of recipient need is premised on the assumption of an altruistic donor, purely motivated by humanitarian motives. Altruism and self-interest are here understood as the extreme points of a continuum of possible motives for which aid is given. In both cases, the underlying idea is that people usually give because they expect something in return (Dudley and Montmarquette (1976), 133). Such expectations tend to be intangible and can include political, economic or humanitarian considerations.

Hybrid models are comprehensively specified with regressors for the different motives of aid. Models with a limited set of regressors, such as the recipient need model and the donor interest model, are attractive due to simplicity and transparency, but may be misspecified due to omitted variables or selection bias (Tarp et al. (1998), 10). The separate estimation of two regression equations inherent to the approach of the two alternative models recipient need and donor interest causes specification bias. Theoretically, such division between the two sets of variables is ambiguous because both are posited to influence aid allocation. Econometrically, it means that both models are misspecified because relevant variables are omitted: If any recipient need variable is relevant to the aid allocation process, then the donor interest model provides biased results, and vice versa, and if recipient need and donor interest variables are relevant, then both recipient need and donor interest equations yield biased results (McGillivray (2003b), 176).

[70] It has been argued that the underlying decision-making process in fact comprises three stages: The first decision being drawing up the list of potential recipients, the second drawing up the potential recipients from the list and the third allocating aid to the selected recipients (McGillivray (2003b): 178, fn. 13). Note that most studies on aid allocation implicitly assume that aid is allocated between countries and not between regions or other units (McGillivray and White (1993): 3).

## 6.2. Modeling the selection decision

Regression models for binary outcomes allow one to explore how each explanatory variable affects the probability of the event occurring.[71] The binary logit and binary probit models are the two most often used models and are referred to jointly as the binary regression model. Due to the nonlinear model, the magnitude of the change in the outcome probability that is associated with a given change in one of the regressors depends on the levels of all regressors. The binary regression model can be derived in three ways, with each method leading to the same mathematical model. First, an unobserved variable can be hypothesized along with a measurement model relating the latent variable to the observed binary outcome. Second, the independent variables are related to the probability of an event in a nonlinear model. Third, the random utility or discrete-choice model is based on the principle that an individual chooses the outcome that maximizes the utility gained from the choice. (Long 1997, 155-156; Long, Freese 2006, 131-132)

The following will focus on the detailed presentation of the first model, which is most appropriate for our purposes. In the latent-variable model, the unobserved variable $DAH^*_{ijt}$ is related to the observed regressors by the structural equation

$$DAH^*_{ijt} = \alpha + \mathrm{X_{ijt}}\beta + \varepsilon_{\mathrm{ijt}}$$

where subscript $i$ denotes the recipient, $j$ the donor, $t$ time and $\varepsilon$ is a random error.[72] The observed binary variable $DAH_{ijt}$ and the latent variable $DAH^*_{ijt}$ are linked by a simple measurement equation. Cases with positive values of $DAH^*$ ($DAH^* > 0$) are observed as $DAH = 1$, whereas cases with negative or zero values of $DAH^*$ ($DAH^* \leq 0$) are observed as $DAH = 0$. This criterion is commonly used as cut-off point in the aid literature. One donor might be close to not selecting a specific country, whereas another donor could be firm in the decision to select a specific country. However, in both cases we observe the exact same outcome $DAH = 1$. The idea of the latent-variable approach is that an underlying propensity to select a recipient generates the observed state. Although it is impossible to directly observe the propensity, at some point a change in $DAH^*$ results in a change in the observed outcome: namely whether a country is being selected. The latent-variable model for country selection is:

$$\Pr(DAH_{ijt} = 1|x) = \Pr\left(DAH^*_{ijt} > 0|x\right) = \Pr\left(\alpha + X_{ijt}\beta + \varepsilon_{ijt} > 0|x\right) = \Pr\left(\varepsilon_{ijt} > -\left[\alpha + X_{ijt}\beta\right]|x\right).$$

Thus, the probability depends on the distribution of the error $\varepsilon_{ijt}$. Two distributions of $\varepsilon_{ijt}$ are commonly assumed, both with an assumed mean of zero. First, if $\varepsilon_{ijt}$ is assumed to be distributed normally with $Var(\varepsilon_{ijt}) = 1$, it leads to the binary probit model. Second, if $\varepsilon_{ijt}$ is assumed to be distributed logistically with $Var(\varepsilon_{ijt}) = \pi^2/3$ it leads to the binary logit model. The value of the variance of the error term must be assumed because the dependent variable is unobserved. The model

[71] The combination of limited dependent variables with panel data usually complicates estimation because different observations on the same unit are not independent, which typically makes the likelihood functions of these models more difficult (Verbeek (2008): 393).

[72] The remainder follows the presentation in Long and Freese (2006): 132-135.

with latent outcome is unidentified unless an assumption is made about the variance of the errors.[73] For both models, the probability of the event occurring is the cumulative distribution function (cdf) of the error term at given values of the independent variables

$$\Pr(DAH_{ijt} = 1|x) = F(X\beta)$$

where F is the normal cdf Φ of the probit model and the logistic cdf Λ for the logit model.[74,75]

The binary response model will calculate a predicted probability of a country's selection as recipient as a function of observed explanatory variables.[76] Let $P_{ijt}$ denote the probability that $DAH_{ijt} = 1$ conditional on the information set $\Omega_{ijt}$, which consists of exogenous and predetermined variables. $P_{ijt}$ is also the expectation of $DAH_{ijt}$ conditional on $\Omega_{ijt}$:

$$P_{ijt} \equiv \Pr[DAH_{ijt} = 1|\Omega_{ijt}] = E[DAH_{ijt}|\Omega_{ijt}].$$

One of the standard solutions has been to use the logistic function that constrains the function to be between zero and one. The logit model ensures that $0 < P_{ijt} < 1$ by specifying that $P_{ijt} \equiv E[DAH_{ijt}|\Omega_{ijt}] = F[X_{ijt}\beta] = \Lambda[X_{ijt}\beta]$. Although the index function $X_{ijt}\beta$ can take any value, the value of $F[X_{ijt}\beta]$ must lie between zero and one. The selection of a country can be derived from the following model involving the observed variable $DAH^*_{ijt}$: $DAH^*_{ijt} = X_{ijt}\beta + \varepsilon_{ijt}$, $\varepsilon_{ijt} \sim NID(0,1)$. The latent variable is linearly related to a set of factors $X_{ijt}$ and an error term $\varepsilon_{ijt}$; but, although $X_{ijt}$ has a linear effect on $DAH_{ijt}$, it will not have a linear effect on the resulting probability that $DAH_{ijt} = 1$ (Baum (2006), 249-250).

## 6.3. Modeling the aid allocation process

Aid allocation studies need to draw a sample of potential recipient countries. If actual recipients are included - those countries with non-zero aid allocations - a threshold is used to partition recipients from non-recipients. The application of OLS provides inconsistent estimates of the regression coefficient because the assumption of a mean linear in $x$ is no longer true and because the partial

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[73] The assumption for the variance of the error term is chosen arbitrarily. However, the probability of an event is unaffected by the identifying assumption regarding the variance of the error term. A change in the assumed variance affects the spread of the distribution but not the proportion of the distribution above or below the threshold. In other words, the assumed variance of the error term affects the regression coefficients but does *not* affect the computed value of the probability. (Long (1997): 49-50; Long and Freese (2006): 134).

[74] The probit model is very similar to the logit model. The only difference is that function $F(X\beta)$ is the cumulative standard normal distribution function $\Phi(x)$ (Davidson and MacKinnon (2004): 453). The choice between logit or probit is primarily one of personal preferences; at least as long as the primary interest lies in marginal effects averaged over the sample (Davidson and MacKinnon (2004), 472).
Maximizing the conditional likelihood function as solution for the latent linear model, however, does not automatically extend to nonlinear models. A *fixed effects probit model* cannot be consistently estimated for fixed *T* because no sufficient statistic for the fixed effect exists. However, a sufficient statistic for the fixed unknown parameter $\alpha_i$ does exist in the *fixed effects logit model* and consistent estimation is possible by conditional maximum likelihood. (Verbeek (2008): 394-395).

[75] In the literature, we sometimes find the term "cumulative density function (cdf)" (e.g. Verbeek (2008), 426). Certainly, this is caused by an unintentional confusion of the terms *probability density function (pdf)* and *cumulative distribution function (cdf)*. For the properties of each function, please refer to Greene (2011), 1056.

[76] The paragraph follows the presentation in Davidson and MacKinnon (2004): 452-453.

effects on the expected value of $y$, conditional on $x$, cannot be constant over a wide range of $x$ (Wooldridge (2010), 668). The observations for which aid is zero lying to the right of all non-zero observations cause the absolute value of the regression coefficient to be underestimated and the corresponding $t$ ratio to be overestimated (McGillivray (2003b), 174). Hence, the correlation between the independent variables and the dependent variable is underestimated, while the probability is higher to reject the null hypothesis when in fact it is true. Since the non-random inclusion or exclusion of observations in the sample for which the aid variable is zero causes biased estimation results, it is recommended to retain all available observations in the sample and employ limited dependent variable techniques to solve the sample selection issue (McGillivray (2003b), 177).

The standard Tobit model, the type II Tobit model and the two-part model are the estimation techniques for limited dependent variables most often used in aid allocation studies. The *standard Tobit model* is suited to model a dependent variable which is zero for a substantial part of the population but positive for the rest of the population (Verbeek (2008), 230).[77] It takes into account the censored nature of the aid variable but imposes a too restrictive structure: the decision-making process is modeled as a one-step process. This restriction implies, first, that the same factors define the selection probability (probability of a nonzero observation) and the allocation (level of a positive observation), second, that the partial effects on an explanatory variable on the selection probability and the aid allocation must have the same signs and, third, that any two explanatory variables have the same relative effects on the selection probability and the allocated amount (Verbeek (2008), 240; Wooldridge (2010), 690). Consequently, the Tobit model excludes the possibility that a regressor increases the selection probability but decreases the volume of allocated aid or vice versa.

The *type II Tobit model* specifies a joint distribution for the selection stage and the allocation stage and then finds the implied distribution conditional on the observed outcome (Cameron and Trivedi (2005), 545).[78] The bivariate sample selection model comprises a participation equation (selection) and a resultant outcome equation (allocation). In Heckman's two-step procedure, the selection equation is first estimated by probit regression. In the second step, the estimated inverse Mills ratio, obtained from the first step, is introduced in the allocation equation in addition to the regressors. A Wald test, based on the estimated coefficient of the inverse Mills ratio, tests whether or not the errors are correlated and sample selection correction is needed (Cameron and Trivedi (2005), 550). The procedure is very popular because it is simple to implement and requires distributional assumptions weaker than joint normality of the error terms. The key assumption is that the error in the allocation equation is a multiple of the error in the selection decision equation, plus some noise that is independent of the selection decision; in other words a linear regression model for the errors (Cameron and Trivedi (2005), 551). The same regressors can appear in both regressions because the bivariate sample

[77] The origin of this model dates back to Tobin's analysis of household expenditures on durable goods taking into account their non-negativity (Tobin (1958)). Arthur Goldberger named this modeling approach a Tobit model due to its similarity to probit models. Amemiya (1985) provided a survey on the original model and its many generalizations, also referred to as Tobit models. (Verbeek (2008), 230-231).

[78] Wooldridge calls Heckman's method the *exponential type II Tobit model*, a corner solution response, in order to clearly distinguish it from the Heckman sample selection model for missing data problems (Wooldridge (2010), 697).

selection model with normal errors is theoretically identified without any restrictions on the regressors. Yet, if the same set of explanatory variables are used the model can be poorly identified because, then, the inverse Mills ratio term is approximately linear over the appropriate range (Wooldridge (2010), 699). In such circumstances, it would be necessary to identify a variable that determines the selection but does not explain allocation in order to avoid that the identification rests solely on the nonlinearity of the inverse Mills ratio term. Such a defensible exclusion restriction has not been found yet.[79]

The *two-part model* has a specification for the engagement in an activity, the country selection, and for the level of activity, conditional on the engagement, the aid allocation. Usually, the same regressors appear in both parts of the model but this should be relaxed if there are obvious exclusion restrictions (Cameron and Trivedi (2005), 545). A general formulation of a convenient model to allow different mechanisms for the selection and allocation decisions is $y = w \times y^*$, with $w$ being a binary variable that determines whether $y$ is zero or strictly positive and $y^*$ being a nonnegative, continuous random variable.[80] The binary variable $w$ is effectively observed but $y^*$ is only observed when $w = 1$, in which case $y^* = y$. The basic assumption of a two-part model, or hurdle model, is that the mechanisms determining $w$ and $y^*$ are independent, conditional on a set of explanatory variables $x$. When $w = 1$, the conditional expectation of $y$, conditional on $y$ being greater than zero, is the expected value of $y^*$, conditional on $x$: $E(y|x, y > 0) = E(y^*|x)$.

Cragg (1971) proposed natural two-part extensions of the type I Tobit model, double-hurdle models. These extensions of the multiple probit analysis model allow "the determination of the size of the variable when it is not zero to depend on different parameters or variables from those determining the probability of its being zero." (Cragg (1971), 829). The above conditional independence assumption is assumed to hold, and the binary variable is assumed to follow a probit model.[81] The model's unique feature is that $y^*$ is assumed to have a truncated normal distribution with parameters that can vary freely from those in the probit. The first part of the *truncated normal model* is estimated with the probit estimator using all observations and the second part is estimated via MLEs from a truncated normal regression using the $y_i > 0$ observations. The effect of $x_j$ has the same sign as $\beta_j$, but the relative effect of two continuous variables on the selection probability can be completely different from the relative effect on the allocation decision. As an alternative, a lognormal distribution conditional on a positive outcome can be used $y = w \times y^* = 1[x\gamma + v > 0]\exp[x\beta + u]$, where the error

[79] Studies that employ Heckman to analyze aid allocation use the same set of explanatory variables at both stages. Neumayer (2003a, b) uses Heckman for sensitivity analyses of the results obtained from a two-part model. The variables of the selection equation and the allocation equation are identical; hence, no exclusion restriction was employed. Berthélemy (2006) uses the Heckman maximum likelihood model but any excluded variable is reported.
It is difficult to make such a defensible exclusion restriction in the context of health assistance because, at least theoretically, the same factors are likely to affect both the selection probability and the aid allocation. In previous estimations, we tried to employ Heckman as robustness check for our results. However, the estimation is not possible if a full set of time dummies is included in both equations. Since the primary interest is in checking whether another estimation method leads to similar results, it does not make sense to exclude variables previously used in order to make the estimation method work.

[80] The remainder follows the presentation in Wooldridge (2010), 690-691.

[81] The remainder summarizes the main points on the two-part model and its extensions, exposed more technically in Wooldridge (2010), 692-696.

terms are independent of $x$ and each other, with a bivariate normal distribution. As with the previous model, the estimation of the parameters can proceed in two steps. The first part of the *lognormal hurdle model* is estimated with probit using all observations and the second part is estimated via OLS with a logged dependent variable using the $y_i > 0$ observations.

The question whether there are significant differences between the determinants of country selection and the determinants of aid allocation as regards health assistance requires a technique that allows the separate modeling of the selection and the allocation decision. Hence, the type I Tobit model is inappropriate.[82] Heckman's two-step procedure allows separate and correlated mechanisms for the selection stage and the allocation stage, after conditioning on covariates. The drawback is to identify a variable that affects the selection but not the allocation in order to find a sensible exclusion restriction. The main weakness of the two-part model is the conditional independence assumption that the errors in both stages are uncorrelated. Consequently, it is assumed that the selection decision is taken independently from the allocation decision. If the conditional independence assumption is wrong, then the second part of the two-part model leads to biased estimates. The predictions are, however, nearly unbiased on average and hence negligible (Manning et al. (1987), 60). Therefore, the lognormal hurdle model as two-part model has been employed.[83]

## 6.4. Fixed effects versus random effects

Many applied researchers estimate fixed-effects model to control for unobserved heterogeneity across units. In principle, it makes sense to use recipient fixed effects that control for unobserved country heterogeneity that may be correlated with the regressors. This approach is useful when the unit *i* denotes countries and predictions are made for a particular country because inference is made with respect to the effects that are in the sample (Verbeek (2008), 367). However, one drawback is that panel data analyses with unit effects do not allow the estimation of time-invariant variables because the fixed-effects model only uses the within variance and disregards the between variance (Baltagi (2008), 15). Since fixed effects are collinear with any time-invariant independent variables, these unchanging variables are dropped from the specification. Although the fixed effects model allows estimating coefficients for variables with little within variance, "the fixed effects will soak up most of the explanatory power of those slowly changing variables" (Beck (2001), 285). A second drawback

[82] The use of limited dependent variable models such as Tobit-type latent variable models has been criticized if used in a context where the data is not truly censored and, consequently, the notion of latent and potentially negative values of the latent variable is difficult to capture (Angrist, Pischke 2009, 100, 102). Truly censoring would mean that "the latent variable has an empirical counterpart that is the outcome of primary interest" (Angrist, Pischke 2009, 102). However, the use of "censored" implies that the possible range of the response variable is not entirely observed which is not the case for corner solution responses (Wooldridge (2010), 667). The fact that aid allocations pile up at zero requires the use of special econometric models, but it is not a problem of data observability (Wooldridge (2010), 667).

[83] The model selection test of Vuong can be used to choose between the lognormal and the truncated normal models. Even if the selection test is in favor of the latter, in many circumstances the lognormal distribution model usually has good estimates too, whereas the inverse is not true (Ai-Chi and Shu-Chin (2008), 202).

results from the inefficiency of the fixed effects model in estimating variables with little within variance because an inefficient estimation leads to highly unreliable point estimates, and may cause incorrect inferences (Plümper and Troeger (2007), 125). If the effect of time-invariant variables in a panel data study is of primary interest, then the fact that the fixed effects estimator is robust to correlation between the unobserved effect and the regressors "is practically useless" (Wooldridge (2002), 288). In addition, for panel data, the presence of country effects complicates matters significantly due to the incidental parameter problem. In a short panel, only the fixed effects estimator of the $\beta$ coefficient is consistent. The fixed effects estimators of the individual effects are inconsistent because the number of these parameters increases as $N$ increases. (Baltagi (2008), 15)[84]

Time-constant variables are either time invariant by definition, such as geography, or are time invariant for the period under analysis, such as institutions (Plümper and Troeger (2007), 126). In our sample, nearly time-invariant variables are, for instance, the level of democracy, the level of political integration or per capita income. The random-effects estimator allows unbundling, for instance, institutions that are otherwise hidden in the fixed effects.

[84] The specification test devised by Hausman (1978) is a useful device for deciding whether a fixed or a random effects model should be used. It tests for orthogonality of the common effects to the regressors. However, the Hausman test has one practical shortcoming: the difference of the two covariance matrices is not necessarily positive definite in a finite sample. The random effects model is not rejected in this case. The similarity of the covariance matrices causes the problem and under the alternative hypothesis of the fixed effects, they would be significantly different. (Greene (2011), 419-420).

# PART IV Empirical analyses

# Chapter 7
# Country selection

## 7.1. Introductory remarks

As commented on in the literature review, few studies in the foreign aid literature have analyzed the motives for country selection separately from the motives of aid allocation. The remarks on modeling the decision-making process have highlighted the differences between the selection of a potential recipient and the subsequent aid allocation. The literature review also showed that, on the one hand, the driving forces for the decisions taken on the country selection vary among individual donors and that, on the other hand, there are little systematic differences across donor groups, if any. The remainder builds on these insights in analyzing the decisions on country selection for health assistance by the average donor and by individual donors.

## 7.2. Country selection decisions by the average donor

The following analysis focuses exclusively on the decision-making process and is guided by the question which effect health indicators have on the selection decision of the (hypothetic) average bilateral donor. The question is embedded in the broader discussion of possible determinants, namely donor's characteristics, recipient's characteristics and their relationship, which may influence the selection probability of a potential recipient. Ten hypotheses classified in five groups are used to test for the importance of several aspects such as need indicators, a favorable institutional environment, efforts for the national health system exerted by the recipient, competition among donors and the bilateral relations between donor and recipient.[85]

### 7.2.1. Estimation approach

The basic equation of the *panel logit model* used to test the hypotheses takes the following form:

$$Pr\left[DAH_{ijt} = 1 \middle| x_{ijt}\right] = Pr\left[DAH^{*}_{ijt} > 0 \middle| x_{ijt}\right] = \mathrm{F}(\mathrm{X_D}, \mathrm{X_R})$$
$$= \Lambda\left[\alpha_i + \nu_t + \beta_d X^{D}_{j,t-1} + \beta_r X^{R}_{i,t-1} + \beta_m X^{DR}_{ij,t-1} + \mu_{ij,t-1}\right]$$
$$i = 1, \dots, 160; j = 1, \dots, 22;\ t = 1, \dots, 18$$

where *i* refers to the recipient, *j* refers to the donor and *t* refers to time, the dependent variable $DAH_{ijt}$ equals one if the latent variable $DAH^{*}_{ijt}$ is greater than zero, and zero otherwise, $\Lambda$ is the logistic function, $\alpha_i$ are recipient-random-effects, $\nu_t$ are time-fixed-effects, $X^{D}_{j,t-1}$ is a vector of variables specific to the donor (donor characteristics), $X^{R}_{i,t-1}$ is a vector of variables specific to the recipient (recipient characteristics), $X^{DR}_{ij,t-1}$ is a vector of variables specific to the country pair, and $\mu_{ij,t-1}$ is the

[85] The hypotheses are summarized in Table 2 at the end of chapter 4.

disturbance term.[86][87] The error term $\mu_{ij,t-1}$ is assumed to be independent over *i*, but it may be correlated over *t* for given *i.* All explanatory variables are lagged by one year to model the decision-making process adequately.[88] The recipient random effects control for unobserved country heterogeneity that is assumed to be independently distributed of the regressors. Time fixed effects control for changes over time that affect all recipients equally.[89]

Following Hendry (1995), a modeling strategy was employed that successively reduced the number of variables included in the model, according to the pattern of at least 5% significance, in order to guarantee the statistical validity of the inference drawn throughout the reduction process. The dynamic panel data logit estimation with country-fixed effects, and a step dummy for the introduction of the MDGs delivered unsatisfying results. Only the budget share of a donor and the selection decision taken the previous year were significant. These results suggested path-dependency to be the decisive factor of the country selection decision. However, in the context of developing countries, not all variables are complete. As a result, the number of observations used in the estimation of the general-to-specific approach was reduced considerably (here 2,547 observations) which made a meaningful interpretation of the results difficult. In addition, due to the many variables with little within variance, country fixed effects did not seem appropriate.

### 7.2.2. Results

In the following, the logit estimation results with random effects for the hypotheses on the selection decision are provided. Year-specific time dummies are included which allow each time period to have its own intercept, controlling for aggregate time effects that affect all receiving countries, such as the agreement on the MDGs in 2000. The reported coefficients are marginal effects because logit coefficients have no intuitive interpretation. The marginal effect is the change in the dependent variable per unit change in the independent variable. The probabilities are conditional on specific values of the independent variables because the logit model is nonlinear; marginal effects show the change in the probability following a marginal increase at the mean of the regressor with all other independent variables held at their average values as well (Powers and Xie (2008): 59-60).[90]

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[86] In the trade literature, dyad fixed effects are increasingly used for analyzing dyadic trade flows; they control for distance, historical and cultural ties between states (e.g. Kerner (2009), 89).

[87] The latent variable $DAH^*$ is observable insofar, as the allocation of aid to a country is an indicator that the country was previously selected as recipient. Nevertheless, it is a latent variable in the sense that the decision-making process and the cutoff-point in favor of, or against, the selection of a country are not truly observed.

[88] The technique makes sense as information to the donors about a recipient is only available with some time lag. The choice to lag the independent variables by one period is somewhat arbitrary. Other time lags have been used to test for robustness.

[89] See comments on fixed and random effects in chapter 6.4.

[90] The mean and variance adaptive Gauss-Hermite quadrature was performed first on every, and then on alternate iterations (StataCorp (2009): 432). The sensitivity of quadrature approximation used in the random-effects estimators has been checked by refitting the model for different numbers of quadrature points, and then comparing the different solutions. The random-effects logit model yields satisfactory results when the model is refitted with 24 integration points than the default 12 integration points. The relative difference of the coefficients does not change by more than 0.01 percent. In

*Interpretation*

Table 8 provides the estimation results for the first hypothesis. Column (1) presents estimation results for the base estimation at 5%, 1% and 0.1% confidence levels. The control variables are taken from the aid allocation literature. Per capita income is used as the standard indicator of poverty in most studies. Similar to the results of research on aid allocation, logged GDP per capita has a significantly negative average marginal effect: A 10% increase in per capita income near the mean $1,075 is associated with a 2.5% decrease in selection probability.[91] The negative relationship between selection probability and per capita income of the receiving country has two important interpretations. On the one hand, it clearly rejects the expectation that the average donor favors the most powerful economies of the respective region. On the other hand, it implies that the neediest countries are selected.[92] The variable population controls for the considerable differences in population size among recipient countries. This variable is included as a standard control variable in aid allocation studies because populous countries are more likely to receive more resources than smaller countries, all other things equal.[93] In our context, the population size has a negative but insignificant coefficient. The variable exports from donor to recipient controls for the economic ties between them, as is standard in the aid allocation literature. Similar to the results of this literature, a 10% increase in exports from donor to recipient near the mean $9.2 million corresponds with a 0.9% increase in selection probability; strong economic ties between donor and recipient have a significantly positive effect on the selection process. Democracy captures the institutional quality. The probability to be selected is increased by 0.4% per one point increase in democracy level near the mean of 0.6 points. The level of democracy has a significantly positive impact on the selection probability. Moreover, we consider colonial history in our estimations, which serves as a proxy for a strong historic link between donors and recipients. Different than in the aid allocation literature, the colonial experience is positive but insignificant. The control variable distance captures the geographic distance between donor and recipient; a 10% increase in distance near the mean 6,905km is associated with a 0.8% increase in selection probability. It follows that distance does have a significant impact on the selection probability and that more distant recipients are more likely selected.

Columns (2), (3) and (4) present estimation results for under-five mortality, maternal mortality and HIV prevalence, respectively. We find a significantly positive relationship between under-five mortality, maternal mortality, the prevalence of HIV, respectively, and the selection probability when

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other words, the choice of quadrature points above the identified thresholds does not significantly affect the outcome. Thus, the results may be confidently interpreted.

91 Please note that the means of the logged value are exponentiated to facilitate interpretation.

92 Recipient need, nevertheless, may coincide with an authoritarian regime, high levels of corruption or other aspects that may impede the sensible use of the aid resources, allocated in the second step, by the receiving authorities.

93 The so-called population bias has been argued either to proxy recipient need, under the assumption that larger developing countries require more foreign aid than smaller countries at the same level of development, or to proxy donor's interest, reflecting the potential economic, political or military power of a country (Maizels and Nissanke (1984): 881). On the one hand, it can be interpreted as anecdotal evidence that donors prefer to spend their limited aid resources where the personal impact for the recipient is the greatest. On the other hand, it provides anecdotal evidence for the conjecture that aid is allocated where the marginal political impact for the donor is the greatest. In general, however, it seems that the observed population bias is the simple result of common donor practice: to allocate aid on a country basis. As each recipient can solicit aid from several donors, smaller countries can benefit disproportionately (Dowling and Hiemenz (1985), 535).

estimated in isolation. Evaluated at the means of the independent variables, the selection probability is changed by approximately 2% per 10% increase in the probability of dying by age five near the mean 74.5‰. A 10% increase in maternal mortality near the mean of 3.5‰ corresponds with a 16% increase in selection probability. With regard to HIV, the selection probability is increased by 25% per 10% point increase of HIV prevalence near the mean of 2.3%.

Table 8. Estimation results for need and development indicators, selection decision by average donor

| | **Base** | **Hypothesis A.1** | | | | | **All variables** | |
|---|---|---|---|---|---|---|---|---|
| | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** |
| (ln) GDPpc | -0.2521 | -0.2151 | -0.2261 | -0.2194 | -0.1898 | -0.2055 | -0.1889 | |
| | (-15.71)*** | (-11.62)*** | (-13.25)*** | (-12.00)*** | (-8.74)*** | (-10.39)*** | (-7.95)*** | |
| (ln) Population | -0.0064 | -0.0015 | 0.0025 | 0.0204 | 0.0155 | -0.0029 | 0.0154 | 0.0537 |
| | (-0.53) | (-0.12) | (0.20) | (1.48) | (1.15) | (-0.25) | (1.15) | (3.75)*** |
| (ln) Exports | 0.0855 | 0.0860 | 0.0863 | 0.0912 | 0.0908 | 0.0870 | 0.0909 | 0.0778 |
| | (12.65)*** | (12.88)*** | (12.90)*** | (12.14)*** | (12.42)*** | (13.03)*** | (12.41)*** | (10.22)*** |
| Democracy | 0.0041 | 0.0045 | 0.0046 | 0.0020 | 0.0019 | 0.0045 | 0.0018 | 0.0018 |
| | (2.22)* | (2.46)* | (2.51)* | (0.97) | (0.90) | (2.47)* | (0.90) | (0.83) |
| (ln) Colonial history | 0.0024 | -0.0112 | -0.0088 | -0.0163 | -0.0250 | -0.0109 | -0.0251 | -0.0419 |
| | (0.27) | (-1.13) | (-0.92) | (-1.65) | (-2.33)* | (-1.13) | (-2.33)* | (-3.52)*** |
| (ln) Distance | 0.0843 | 0.0895 | 0.0772 | 0.0507 | 0.0634 | 0.0902 | 0.0636 | 0.0913 |
| | (3.03)** | (3.26)** | (2.81)** | (1.56) | (2.00)* | (3.31)*** | (2.00)* | (2.58)** |
| Under-five mortality | | 0.0013 | | | 0.0025 | | 0.0025 | 0.0030 |
| | | (3.22)** | | | (4.36)*** | | (3.43)*** | (3.77)*** |
| Maternal mortality | | | 0.0162 | | -0.0275 | | -0.0275 | -0.0245 |
| | | | (3.28)** | | (-3.62)*** | | (-3.62)*** | (-2.92)** |
| HIV prevalence | | | | 0.0225 | 0.0254 | | 0.0254 | 0.0203 |
| | | | | (8.23)*** | (8.26)*** | | (8.17)*** | (6.17)*** |
| HDI | | | | | | -0.0048 | -0.0002 | -0.0079 |
| | | | | | | (-3.51)*** | (-0.10) | (-3.38)*** |
| Observations | 8,464 | 8,464 | 8,464 | 6,202 | 6,202 | 8,464 | 6,202 | 6,202 |
| No. of groups | 1,332 | 1,332 | 1,332 | 1,012 | 1,012 | 1,332 | 1,012 | 1,012 |
| log likelihood | -3,575.33 | -3,570.08 | -3,569.91 | -2,649.15 | -2,638.83 | -3,569.17 | -2,638.83 | -2,670.22 |
| Chi-squared | 510.09 | 513.58 | 515.46 | 435.42 | 449.47 | 519.36 | 449.55 | 394.72 |
| Quadrature points | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |

Dependent variable is selection probability (1 = receives aid; 0 = does not receive aid). Estimates are based on the logit maximum likelihood procedure. Robust standard errors. All equations include year-specific time dummies. Coefficient of constant not reported. t-statistics are reported below the marginal coefficient estimates. Coefficients represent change in probability at the mean of regressors given a marginal increase in the variable. All time-varying regressors are lagged by one year. ***, **, and * denote significance at 0.1, 1, and 5 percent, respectively. Note also that the sample varies between columns because of data availability for some variables.

In column (5) all MDG indicators are included. The results remain basically the same for all coefficients; however, the coefficient of maternal mortality becomes negative, when the health indicators are estimated together. At first sight, this suggests that a higher maternal mortality rate decreases the selection probability by the average donor, controlling for under-five mortality and HIV prevalence. Additional tests with pair-wise estimations of the three health indicators show, however, that maternal mortality has no significant effect on the selection decision. When jointly estimated with under-five mortality or HIV prevalence, the coefficient of maternal mortality is insignificant. The coefficients of the respective other health indicator, however, remain the same in terms of significance and magnitude. Consequently, the negative coefficient of maternal mortality in columns (5), (7) and

(8) does not seem to represent a significant reduction of the selection probability, but rather to be owed to multicollinearity.[94]

Column (6) presents estimation results after considering the HDI. We find a significantly negative relationship between the development indicator and the selection decision. Evaluated at the means of the regressors, the selection probability is decreased by 5% per 10% point increase in the HDI near the mean of 58.1 points. In other words, the less developed a receiving country, visible in a low HDI, the more likely it is selected by the average donor. When health indicators and need indicator are considered simultaneously, the results are roughly the same. Countries with higher levels of under-five mortality, higher prevalence of HIV and lower development score have a higher probability of being selected. The coefficient of maternal mortality suggests that higher levels decrease the chances of being selected. Our findings partly confirm our hypotheses on poor health indicators and poor development indicators. However, the relative impact on the selection probability varies between health indicators and need indicators. In column (7) we have tested all variables together. The level of human development in the recipient country has no additional explanatory power, when control variables and health indicators are controlled for. The coefficients remain largely the same as the results in column (5). In column (8) per capita income is excluded. Again, we find a significantly negative relationship between human development and the selection probability. The other coefficients remain largely the same. However, population size becomes significant, when income per capita is excluded. While the effects of the control variables colonial history and distance slightly increase, the effect of exports slightly decreases.

The estimation results for the hypotheses two and three are presented in Table 9. Rights and liberties are added in column (2). The proxy for the general freedom in the recipient country has no significant impact on the selection decision. In column (3) economic freedom is controlled for. The level of economic freedom has a significantly positive impact on the selection probability. Neither government effectiveness, included in column (4), nor the perceived level of corruption, controlled for in column (5), has a significant effect on the selection decision. In column (6) all variables measuring the quality of the institutional environment have been added. The coefficient on economic freedom has a significantly positive effect on the selection probability by the average donor. A 10% increase in economic freedom near the mean of 5.7 points is associated with a roughly 35% increase in selection probability. The marginal effect of rights and liberties, government effectiveness and the level of corruption is insignificant. The other coefficients remain the same, once the other measures for

[94] On the one hand, multicollinearity leads to imprecision in the estimator, but, on the other hand, not to any systematic biases in estimation (Greene (2011), 129). The principal consequence is that the variances and standard errors of the estimates will increase. Due to this larger variance, the likelihood to obtain an unexpected sign for a coefficient is greater (Studenmund (2011), 252). We think that this is the reason as to why the coefficient on maternal mortality has a negative sign. Since every remedy for multicollinearity has some sort of drawback and can even become "attempts to force the theory on the data" (Greene (2011), 131), we decided to accept that maternal mortality and HIV prevalence rate, respectively maternal mortality and under-five mortality, are imperfectly linearly related.

institutional quality are included, but the coefficient of democracy becomes insignificant. In column (7) the democracy variable is excluded; the results of the other coefficients remain largely the same.

These findings suggest that the institutional environment in the recipient country influences the selection decision of the average donor primarily with respect to economic freedom. Little general freedom, low effectiveness of the government or high corruption levels does not statistically affect the selection probability of a recipient country in our sample.

Table 9. Estimation results for institutions and effort, selection decision by average donor

| | **Base** | **Hypothesis A.2** | | | | | | **Hypothesis A.3** | |
|---|---|---|---|---|---|---|---|---|---|
| | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** | **(9)** |
| (ln) GDPpc° | -0.2521 | -0.2524 | -0.2603 | -0.2624 | -0.2516 | -0.2641 | -0.2655 | -0.2483 | -0.2497 |
| | (-15.71)*** | (-15.71)*** | (-15.81)*** | (-14.20)*** | (-15.65)*** | (-14.26)*** | (-14.35)*** | (-13.96)*** | (-14.31)*** |
| (ln) Population° | -0.0064 | -0.0066 | -0.0048 | -0.0073 | -0.0067 | -0.0059 | -0.0065 | 0.0046 | 0.0045 |
| | (-0.53) | (-0.54) | (-0.40) | (-0.61) | (-0.55) | (-0.48) | (-0.53) | (0.35) | (0.35) |
| (ln) Exports° | 0.0855 | 0.0855 | 0.0839 | 0.0853 | 0.0855 | 0.0840 | 0.0838 | 0.0866 | 0.0866 |
| | (12.65)*** | (12.65)*** | (12.40)*** | (12.60)*** | (12.65)*** | (12.40)*** | (12.36)*** | (12.35)*** | (12.35)*** |
| (ln) Democracy° | 0.0041 | 0.0041 | 0.0031 | 0.0039 | 0.0041 | 0.0031 | | 0.0051 | 0.0051 |
| | (2.22)* | (2.19)* | (1.66) | (2.10)* | (2.24)* | (1.64) | | (2.59)** | (2.63)** |
| (ln) Colonial history | 0.0024 | 0.0023 | 0.0056 | 0.0030 | 0.0024 | 0.0056 | 0.0065 | 0.0037 | |
| | (0.27) | (0.26) | (0.61) | (0.33) | (0.27) | (0.61) | (0.71) | (0.38) | |
| (ln) Distance | 0.0843 | 0.0841 | 0.0735 | 0.0799 | 0.0848 | 0.0724 | 0.0734 | 0.1087 | 0.1114 |
| | (3.03)** | (3.02)** | (2.62)** | (2.84)** | (3.05)** | (2.56)* | (2.59)** | (3.29)*** | (3.45)*** |
| Rights and liberties° | | -0.0016 | | | | -0.0014 | -0.0019 | | |
| | | (-0.34) | | | | (-0.30) | (-0.40) | | |
| Economic freedom° | | | 0.0341 | | | 0.0328 | 0.0375 | | |
| | | | (2.37)* | | | (2.19)* | (2.54)* | | |
| Government effectiveness° | | | | 0.0292 | | 0.0134 | 0.0152 | | |
| | | | | (1.09) | | (0.48) | (0.55) | | |
| CPI° | | | | | -0.0012 | -0.0020 | -0.0017 | | |
| | | | | | (-0.31) | (-0.51) | (-0.44) | | |
| Public health expenditures° | | | | | | | | 0.0056 | 0.0051 |
| | | | | | | | | (0.44) | (0.40) |
| Immunization rates° | | | | | | | | -0.0002 | -0.0002 |
| | | | | | | | | (-0.26) | (-0.34) |
| Observations | 8,464 | 8,464 | 8,464 | 8,464 | 8,464 | 8,464 | 8,464 | 7,810 | 7,810 |
| No. of groups | 1,332 | 1,332 | 1,332 | 1,332 | 1,332 | 1,332 | 1,332 | 1,241 | 1,241 |
| log likelihood | -3,575.33 | -3,575.27 | -3,572.52 | -3,574.74 | -3,575.28 | -3,572.23 | -3,573.58 | -3,318.69 | -3,318.77 |
| Chi-squared | 510.09 | 510.03 | 515.01 | 512.30 | 510.03 | 515.48 | 514.08 | 480.70 | 480.88 |
| Quadrature points | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |

Dependent variable is selection probability (1 = receives aid; 0 = does not receive aid). Estimates are based on the logit maximum likelihood procedure. Robust standard errors. All equations include year-specific time dummies. Coefficient of constant not reported. t-statistics are reported below the marginal coefficient estimates; coefficients represent change in probability at the mean of regressors given a marginal increase in the variable. All time-varying regressors are lagged by one year. ***, **, and * denote significance at 0.1, 1, and 5 percent, respectively. Note also that the sample varies between columns because of data availability for some variables.

In column (8) we included public expenditures on health and immunization rates as proxies for the recipient's own efforts in terms of health care services. The marginal effect of public health expenditures and of the immunization coverage is insignificant. The results of all explanatory variables remain largely the same when colonial history is excluded in column (9). Hence, a recipient's efforts have no immediate effect on the selection probability by the average donor.[95]

[95] Additionally, we have restricted the time period by focusing on the years 2002-2007, and rerun the regression for hypothesis A.2 with this restricted sample. As before, few rights and liberties, low effectiveness of the government or high corruption levels does not statistically affect the selection probability of a recipient country in our sample. Even economic freedom is no longer statistically significant. None of the coefficients has a significant effect on the average selection decision, neither estimated separately nor simultaneously. Hence, the results do not suggest any major policy change of the average donor in terms of the selectivity regarding the institutional quality of the recipient country.

Table 10 reports the results for the hypothesis on rivalry. The variable donor size is added in column (2). The coefficient is positive and significant. The selection probability is 15% higher if the donor has a budget share of equal or greater than five percent. In column (3), the selection decision by the US is controlled for. Statistically significant, the chances for a recipient to be selected by other donors are more than 50% higher if the recipient was selected by the US the previous year. In column (4), we test for both the donor size and US selection decision. The results show that both coefficients are positive and significant. This suggests a significant impact of the relative size of a donor and the US choice on the selection decisions on average.

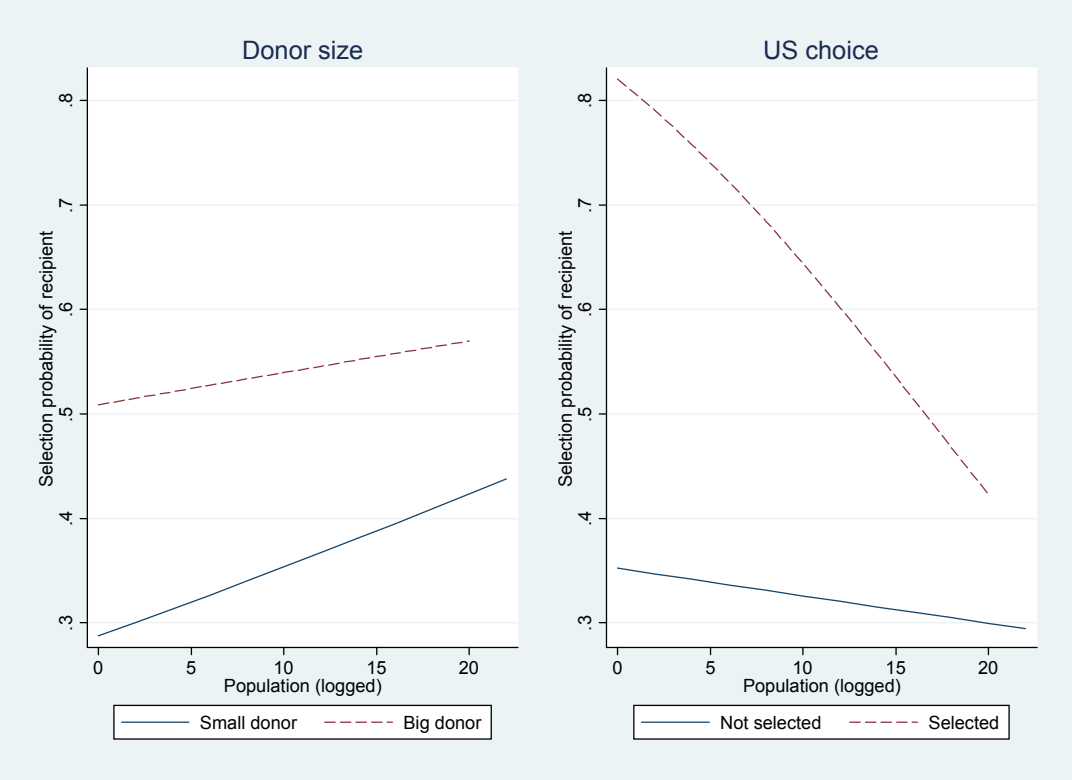
Table 10. Estimation results for rivalry, selection decision by average donor

| | | Hypothesis A.4 | | |
|---|---|---|---|---|
| | **Base** | **A.4.1** | **A.4.2** | **All variables** |
| | **(1)** | **(2)** | **(3)** | **(4)** |
| (ln) GDPpc° | -0.2521 | -0.2345 | -0.2321 | -0.2201 |
| | (-15.71)*** | (-14.97)*** | (-15.10)*** | (-14.49)*** |
| (ln) Population° | -0.0064 | 0.0058 | 0.0040 | 0.0132 |
| | (-0.53) | (0.49) | (0.35) | (1.16) |
| (ln) Exports° | 0.0855 | 0.0719 | 0.0725 | 0.0627 |
| | (12.65)*** | (10.70)*** | (11.12)*** | (9.59)*** |
| (ln) Democracy° | 0.0041 | 0.0039 | 0.0037 | 0.0036 |
| | (2.22)* | (2.18)* | (2.09)* | (2.05)* |
| (ln) Colonial history | 0.0024 | 0.0041 | 0.0077 | 0.0086 |
| | (0.27) | (0.47) | (0.89) | (1.01) |
| (ln) Distance | 0.0843 | 0.0650 | 0.0459 | 0.0344 |
| | (3.03)** | (2.40)* | (1.73) | (1.31) |
| Donor size° | | 0.1508 | | 0.1232 |
| | | (6.68)*** | | (5.57)*** |
| US choice° | | | 0.5221 | 0.4789 |
| | | | (9.03)*** | (8.49)*** |
| Observations | 8,464 | 8,464 | 8,464 | 8,464 |
| No. of groups | 1,332 | 1,332 | 1,332 | 1,332 |
| log likelihood | -3,575.33 | -3,516.29 | -3,552.60 | -3,507.42 |
| Chi-squared | 510.09 | 547.16 | 536.09 | 580.59 |
| Quadrature points | 24 | 24 | 24 | 24 |

Dependent variable is selection probability (1 = receives aid; 0 = does not receive aid). Estimates are based on the logit maximum likelihood procedure. Robust standard errors. All equations include year-specific time dummies. Coefficient of constant not reported. t-statistics are reported below the marginal coefficient estimates; coefficients represent change in probability at the mean of regressors given a marginal increase in the variable. All time-varying regressors are lagged by one year. ***, **, and * denote significance at 0.1, 1, and 5 percent, respectively. Note also that the sample varies between columns because of data availability for some variables.

To visualize the model, a plot of the predicted probabilities versus the logged population has been produced. On the left hand side, with separate curves for small donors and big donors, the graph shows that the selection probability for recipient countries with larger populations is higher. It also illustrates the difference between the average small donor and the average big donor. The chances to be selected by the average big donor are greater, regardless of the recipient's population size. The average small donor seems to select recipient countries with large populations with higher probability.

Figure 18. Predicted probabilities for hypothesis on rivalry




The second graph on the right hand side plots the predicted probabilities versus the logged population, with separate curves for recipients selected by the US and those that were not. Less populous receiving countries that were selected by the US seem to be more attractive to other donors. The larger the population in the recipient country is, however, the less likely it is also selected by other donors. The non-selection does not appear to have much effect on the selection decision by others. The result suggests that the selection choice by the United States has a very important signaling effect for other donors as regards recipients with small populations.

Table 11 presents the estimation results for the fifth hypothesis. Column (2) added imports, whereas column (3) exports and imports replaced total trade between donor and recipient. The marginal effect of imports is positive and significant. Evaluated at the means of the independent variables, the selection probability is increased by 0.2% if the imports of the donor from the recipient are 10% higher than the mean 7 million. The coefficient on trade is also positive and significant. The probability to be selected is increased by 0.8% if the trade volume between donor and recipient is 10% higher than the mean 18 million. The results suggest that strong economic ties, visible in trade figures between donor and recipient, have a significantly positive impact on the selection probability.

In column (4) political integration and political proximity, as proxies for political links between donors and recipients, are included. Colonial history is excluded in column (5). In both cases, the coefficients on the proxies for political links are positive but insignificant. The same political color or the political collaboration between donor and recipient does not increase the chances to be selected as

recipient. Thus, a strong political relationship between donor and recipient does not have any significant impact on the average selection decision.

Common language, common religion and social integration as proxies for a strong cultural link between donors and recipients were included in column (6). Colonial history is excluded in column (7). Common language has a significantly positive impact on the probability to be selected. The selection probability is more than 25% higher if the donor country and the recipient country share the same dominant language compared to the opposite case. The other proxy for cultural proximity, religion, also has a significantly positive impact on the selection probability. It increases by approximately 14% if the donor and the recipient share the same dominant religion. The coefficient of social integration is significant but negative. The selection probability is reduced by 5% per 10% increase on the social integration index near the mean of 34.5 points. When cultural components are controlled for, the coefficient of the distance variable becomes insignificant. The results suggest that a strong cultural relationship, visible in a common language or a common religion between donor and recipient, has a significantly positive impact on the average selection probability.

In column (8) we introduce a difference between a former own colony and a former colony of another donor by exchanging colonial history for the variables own colony and other colony. The marginal effect of the former is positive and significant, while the latter is negative and insignificant. A 10% increase in time as former colony near the mean of 1.1 years corresponds with a 0.9% increase in selection probability. These results suggest that the common colonial experience provides the decisive link between donor and recipient in terms of the selection probability, rather than the colonial experience in general.

Continent dummies were added to the base specification in column (9). The America dummy is positive and significant, while the Asia and Oceania dummies are negative and significant. The Europe dummy is also negative but insignificant. The selection probability for a recipient located on the American continent is 25% higher than for an African country.[96] An Asian country is 17% less likely selected and a country in Oceania one third less likely selected than an African country. A European country has a selection probability of almost 10% less than a country on the African continent; however, the marginal coefficient is insignificant. The coefficients of the control variables remain largely the same.

In column (10) and (11), we present the results for the joined test of all significant relationship variables. The first column controls for exports and imports, while the second controls for total trade. The coefficients of economic, cultural, historic and geographic ties remain largely the same when jointly tested.

[96] The sensibility check reveals that the selection probability is driven by the selection choices of Canada and the US and is therefore an outlier of the sample used for estimation.

Table 11. Estimation results for relational ties, selection decision by average donor

| | | Hypothesis A.5 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Base | Economic | | Political | | Cultural | | Historic | Geographic | All variables | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| (ln) GDPpc° | -0.2521 | -0.2630 | -0.2508 | -0.2432 | -0.2486 | -0.1920 | -0.1910 | -0.2448 | -0.2298 | -0.1902 | -0.1841 |
| | (-15.71)*** | (-16.02)*** | (-15.04)*** | (-13.77)*** | (-14.37)*** | (-10.62)*** | (-10.55)*** | (-15.35)*** | (-14.27)*** | (-10.52)*** | (-10.03)*** |
| (ln) Population° | -0.0064 | -0.0201 | -0.0034 | -0.0100 | -0.0099 | 0.0154 | 0.0151 | -0.0022 | 0.0099 | 0.0041 | 0.0197 |
| | (-0.53) | (-1.64) | (-0.27) | (-0.67) | (-0.66) | (1.27) | (1.24) | (-0.18) | (0.77) | (0.32) | (1.49) |
| (ln) Exports° | 0.0855 | 0.0785 | | 0.0873 | 0.0875 | 0.0803 | 0.0804 | 0.0803 | 0.0798 | 0.0686 | |
| | (12.65)*** | (9.77)*** | | (12.27)*** | (12.26)*** | (12.40)*** | (12.39)*** | (11.85)*** | (12.05)*** | (9.03)*** | |
| Democracy° | 0.0041 | 0.0036 | 0.0041 | 0.0047 | 0.0047 | 0.0029 | 0.0028 | 0.0041 | 0.0030 | 0.0016 | 0.0021 |
| | (2.22)* | (1.94) | (2.16)* | (2.39)* | (2.37)* | (1.63) | (1.59) | (2.22)* | (1.60) | (0.89) | (1.14) |
| (ln) Colonial history | 0.0024 | 0.0034 | 0.0032 | 0.0106 | | -0.0141 | | | -0.0079 | -0.0123 | -0.0129 |
| | (0.27) | (0.38) | (0.34) | (1.07) | | (-1.58) | | | (-0.76) | (-1.22) | (-1.25) |
| (ln) Distance | 0.0843 | 0.0805 | 0.0577 | 0.0981 | 0.1098 | 0.0428 | 0.0314 | 0.0807 | 0.1168 | 0.0654 | 0.0491 |
| | (3.03)** | (2.92)** | (2.02)* | (3.29)** | (3.91)*** | (1.61) | (1.23) | (2.94)** | (3.75)*** | (2.12)* | (1.54) |
| (ln) Imports° | | 0.0156 | | | | | | | | 0.0117 | |
| | | (2.70)** | | | | | | | | (2.14)* | |
| (ln) Trade° | | | 0.0794 | | | | | | | | 0.0660 |
| | | | (11.29)*** | | | | | | | | (9.85)*** |
| Political integration° | | | | 0.0008 | 0.0010 | | | | | | |
| | | | | (0.77) | (0.97) | | | | | | |
| Political proximity° | | | | 0.0269 | 0.0274 | | | | | | |
| | | | | (1.26) | (1.28) | | | | | | |
| Dominant language | | | | | | 0.2657 | 0.2552 | | | 0.1992 | 0.2460 |
| | | | | | | (6.05)*** | (5.88)*** | | | (4.44)*** | (5.38)*** |
| Dominant religion | | | | | | 0.1356 | 0.1366 | | | 0.1089 | 0.0973 |
| | | | | | | (4.37)*** | (4.39)*** | | | (3.18)** | (2.78)** |
| Cultural integration° | | | | | | -0.0047 | -0.0042 | | | -0.0047 | -0.0038 |
| | | | | | | (-3.37)*** | (-3.09)** | | | (-3.30)*** | (-2.63)** |
| (ln) Own Colony | | | | | | | | 0.0992 | | 0.0728 | 0.0807 |
| | | | | | | | | (3.77)*** | | (2.95)** | (3.16)** |
| (ln) Other Colony | | | | | | | | -0.0016 | | | |
| | | | | | | | | (-0.17) | | | |
| America | | | | | | | | | 0.2466 | 0.2137 | 0.2508 |
| | | | | | | | | | (2.79)** | (2.53)* | (2.85)** |
| Asia | | | | | | | | | -0.1652 | -0.0497 | -0.0519 |
| | | | | | | | | | (-3.98)*** | (-1.14) | (-1.15) |
| Europe | | | | | | | | | -0.0866 | -0.0181 | -0.0162 |
| | | | | | | | | | (-1.15) | (-0.25) | (-0.21) |
| Oceania | | | | | | | | | -0.3207 | -0.3481 | -0.3931 |
| | | | | | | | | | (-3.06)** | (-3.37)*** | (-3.68)*** |
| Observations | 8,464 | 8,229 | 8,464 | 7,545 | 7,545 | 8,464 | 8,464 | 8,464 | 8,464 | 8,229 | 8,464 |
| No. of groups | 1,332 | 1,286 | 1,332 | 1,173 | 1,173 | 1,332 | 1,332 | 1,332 | 1,332 | 1,286 | 1,332 |
| log likelihood | -3,575.33 | -3,474.19 | -3,590.78 | -3,232.60 | -3,233.17 | -3,538.42 | -3,539.68 | -3,566.98 | -3,553.11 | -3,424.59 | -3,536.03 |
| Chi-squared | 510.09 | 505.75 | 480.85 | 448.91 | 448.82 | 543.55 | 541.42 | 512.88 | 533.08 | 541.52 | 525.57 |
| Quadrature points | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |

Dependent variable is selection probability (1 = receives aid; 0 = does not receive aid). Estimates are based on the logit maximum likelihood procedure. Robust standard errors. All equations include year-specific time dummies. Coefficient of constant not reported. t-statistics are reported below the marginal coefficient estimates. Coefficients represent change in probability at the mean of regressors given a marginal increase in the variable. All time-varying regressors are lagged by one year. ***, **, and * denote significance at 0.1, 1, and 5 percent, respectively. Note also that the sample varies between columns because of data availability for some variables.

### 7.2.3. Sensitivity analysis

The results are robust to several sensitivity checks. First, we tried a different time lag of two years. Economic freedom is insignificant, the decision taken by the United States affects the selection probability half as much as before, and imports are also insignificant. These changes do not affect any other coefficient. Second, in order to assess, at least tentatively, whether the diversity of recipient countries affects our results, we consider a more homogeneous subsample of developing countries by dropping transition countries.[97] Rights and liberties, economic freedom and social integration are insignificant. Again, these changes do not affect any other coefficient. Third, we checked whether the diversity of donor countries affects our results. Therefore, we excluded Canada and the US as those donors that account for almost twenty percent of all selection decisions in the sample considered in the logit estimations. Rights and liberties and economic freedom are insignificant; the CPI coefficient is significant but negative, without affecting any other coefficient. This result suggests that the average donor, when the North American donors are excluded, selects countries with high corruption levels less likely. If the selection decision by the US is not included, the relative importance of a donor, visible in the budget size, becomes more decisive for the selection decision. Again, the other coefficients are not affected. The exclusion of the North American donors leads to some changes in the results of the relationship hypothesis. In terms of economic ties, imports are insignificant. When exports are replaced by trade, distance is insignificant. In terms of a cultural relationship, population is significant and social integration is insignificant. The results of the historic link change insofar as democracy is insignificant. In all cases, these changes do not affect any other coefficient; neither do the changed significance levels imply any change in direction or strength of the relationship.

We were not able to estimate all hypotheses with other similar variables but some were exchanged with respect to indicators of institutional quality in order to check if the results are sensitive to the variables used. The *Index of Economic Freedom* (IEF) replaced economic freedom. The overall economic freedom score for each economy is constructed by ten components measuring an aspect of economic freedom on a scale from 0 to 100, equally weighted and averaged (Miller et al. (2011): 447). One of the Worldwide Governance Indicators, control of corruption, replaced the Corruption Perception Index. *Corruption* captures perceptions of the extent to which public power is exercised for private gain (Kaufmann et al. (2010): 4); it is recoded such that the indicators range from -2.5 to 2.5, with higher values corresponding to more corruption. A 10% increase of the IEF near the mean of 55 points corresponds with a 7% increase of the selection probability. Regardless of the variable used to approximate corruption, is has no significant effect on the selection decision by the average donor. The other coefficients remain largely unchanged. These findings suggest that economic freedom has a significantly positive impact on the selection probability independent from the variable used. The magnitude of the effect, however, is subject to change.

[97] Which also means that almost all European recipients are dropped (Albania, Belarus, Bosnia and Herzegovina, Croatia, Macedonia, Montenegro, Serbia, and Ukraine are considered as transition countries).

The sensitivity checks suggest that the results are not driven by the specification or outliers. Although the exclusion of the North American donors changes the results for hypotheses two and five slightly, the main estimation results of the health indicators are not affected by any robustness check.

The findings of Dollar and Levin (2006), and Isopi and Mavrotas (2009) suggest that donors have become more selective in recent years. Therefore, we restrict the time period on the years 2002 till 2007, and re-estimate the regression for the first hypothesis as last sensitivity check. As shown in Table 12, the results of the baseline estimation in column (1) remain the same. The results for the health indicators are similar to the general estimates. We find that also under-five mortality has a significantly positive effect but of small magnitude, whereas maternal mortality and HIV prevalence continue to have a significantly positive impact on health assistance.

Table 12. Estimation results for need and development indicators (2002-2007), selection decision by average donor

| | **Base** | **Hypothesis A.1** | | | | | **All variables** | |
|---|---|---|---|---|---|---|---|---|
| | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** |
| (ln) GDPpc | -0.2536 | -0.2104 | -0.2290 | -0.2223 | -0.1942 | -0.1672 | -0.1678 | |
| | (-14.17)*** | (-10.22)*** | (-12.06)*** | (-11.17)*** | (-8.12)*** | (-7.28)*** | (-5.91)*** | |
| (ln) Population | 0.0030 | 0.0087 | 0.0112 | 0.0264 | 0.0182 | 0.0127 | 0.0197 | 0.0504 |
| | (0.23) | (0.66) | (0.83) | (1.79) | (1.25) | (0.97) | (1.35) | (3.36)*** |
| (ln) Exports | 0.0840 | 0.0843 | 0.0848 | 0.0912 | 0.0907 | 0.0852 | 0.0912 | 0.0811 |
| | (11.12)*** | (11.33)*** | (11.34)*** | (11.11)*** | (11.32)*** | (11.54)*** | (11.34)*** | (9.90)*** |
| Democracy | 0.0066 | 0.0071 | 0.0073 | 0.0031 | 0.0017 | 0.0078 | 0.0019 | 0.0027 |
| | (2.60)** | (2.85)** | (2.90)** | (1.06) | (0.62) | (3.14)** | (0.67) | (0.91) |
| (ln) Colonial history | 0.0002 | -0.0157 | -0.0106 | -0.0213 | -0.0298 | -0.0242 | -0.0340 | -0.0528 |
| | (0.02) | (-1.46) | (-1.02) | (-2.06)* | (-2.60)** | (-2.26)* | (-2.89)** | (-4.27)*** |
| (ln) Distance | 0.0927 | 0.0990 | 0.0867 | 0.0643 | 0.0768 | 0.1009 | 0.0814 | 0.1087 |
| | (3.09)** | (3.34)*** | (2.93)** | (1.88) | (2.29)* | (3.45)*** | (2.41)* | (3.00)** |
| Under-five mortality | | 0.0015 | | | 0.0030 | | 0.0018 | 0.0009 |
| | | (3.25)** | | | (4.62)*** | | (1.97)* | (0.95) |
| Maternal mortality | | | 0.0151 | | -0.0361 | | -0.0372 | -0.0352 |
| | | | (2.71)** | | (-4.23)*** | | (-4.33)*** | (-3.82)*** |
| HIV prevalence | | | | 0.0243 | 0.0293 | | 0.0279 | 0.0215 |
| | | | | (7.84)*** | (8.14)*** | | (7.59)*** | (5.83)*** |
| HDI | | | | | | -0.0086 | -0.0061 | -0.0186 |
| | | | | | | (-4.84)*** | (-1.70) | (-5.73)*** |
| Observations | 5,897 | 5,897 | 5,897 | 4,348 | 4,348 | 5,897 | 4,348 | 4,348 |
| No. of groups | 1,332 | 1,332 | 1,332 | 1,012 | 1,012 | 1,332 | 1,012 | 1,012 |
| log likelihood | -2,539.15 | -2,533.75 | -2,535.46 | -1,890.14 | -1,877.38 | -2,527.03 | -1,875.93 | -1,893.09 |
| Chi-squared | 320.00 | 322.47 | 322.98 | 260.28 | 272.81 | 328.09 | 272.49 | 241.00 |
| Quadrature points | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |

Dependent variable is selection probability (1 = receives aid; 0 = does not receive aid). Estimates are based on the logit maximum likelihood procedure. Robust standard errors. All equations include year-specific time dummies. Coefficient of constant not reported. t-statistics are reported below the marginal coefficient estimates. Coefficients represent change in probability at the mean of regressors given a marginal increase in the variable. All time-varying regressors are lagged by one year. ***, **, and * denote significance at 0.1, 1, and 5 percent, respectively. Note also that the sample varies between columns because of data availability for some variables.

When jointly estimated, under-five mortality continues to have a significantly positive, but only small, effect on the selection probability. The coefficient of HIV prevalence remains largely the same in significance and magnitude. However, as before, the coefficient of maternal mortality switches signs.

Again, an additional test, in which the health indicators are included as pairs, shows that maternal mortality has no significant effect on the selection decision.

The coefficients for the control variables remain largely unchanged. However, democracy is no longer statistically significant, while the colonial history has a significantly negative effect on the selection probability. In general, these results suggest that the average donor has not based the selection decision for health assistance more on recipient need as expressed in poor health indicators or in low human development in recent years.

### 7.2.4. Concluding remarks

The previous analysis of the selection decision of the average donor shows that many determinants need to be taken into consideration in order to adequately model the selection process, but also in order to avoid omitted variable bias. The common distinction between development needs and donor interests has been expanded to the neutral framework focusing on donor characteristics, recipient characteristics and their relationship. The selection process for development assistance for health is based on health indicators, but also many other factors influence the decision.

The *first hypothesis* poses the question to what extent health indicators, respectively general development indicators, influence the selection process of the average bilateral donor. The results show that not all three health indicators matter for the selection decision of the average donor. In summary, under-five mortality has a significant, but marginal, effect on the average selection decision. In isolation, maternal mortality has a significantly positive effect on the selection probability. When under-five mortality or HIV prevalence is also controlled for, the effect vanishes and the coefficient becomes insignificant. Jointly estimated with both health indicators, the coefficient of maternal mortality is significantly negative, which seems to be owed to the collinearity among the health indicators. Consequently, the rate of HIV prevalence is, ceteris paribus, the health indicator with the most consistent effect on the selection decision by the average donor. As regards the general development level of a recipient, the average donor seems to take that into account, but with a small effect.

The *second hypothesis* asks for the importance of relatively strong institutions as indicator of a favorable environment. On the one hand, the quality of the institutional environment in a receiving country has an impact on the selection probability because a recipient with a greater economic freedom is more likely to be selected. The results for the other proxies show, on the other hand, that the level of democracy, the level of general freedom and perceived corruption have no significant impact on the decision. Restricting the sample on the 2000s, none of the variables has a significant effect on the average selection decision, neither estimated separately nor simultaneously. Hence, the selectivity of donors regarding the quality of the institutional environment has decreased. It seems that a country is selected regardless of potential problems, for example, with an autocratic or corrupt environment. The developing country is selected as a potential recipient despite the great chances that

resources will not be used for what they are intended for, but instead be diverted into bureaucrats' pockets. In summary, the quality of the institutional environment is only of little importance for the selection decision by the average donor.

The *third hypothesis* that donors take into consideration the recipients' efforts in terms of health care services could not be confirmed. Neither the national expenditures for public health nor the immunization coverage rate has a significant impact on the selection probability by the average donor. The average donor does in fact not appreciate their efforts and, hence, the selection decision is dictated by other considerations. A drawback of the immunization rates is that they are at least partially the result of international campaigns financed by bodies other than the national government.

The *fourth hypothesis* focuses on the questions to what extent strategic interactions among donors, as evidenced by the relative importance of the donor respectively the selection decision of the financially strongest donor, are important for the decision process on average. The findings show that selection probability of a recipient increases with the relative budget size of the donor. As regards the interdependencies of donor decisions, the results provide evidence that the average donor does not decide independently but act strategically. The US selection choice seems to be the yardstick for the average donor, at least for the selection decision of populous recipient countries. These results suggest that aggregate studies need to account for strategic interaction among donors in order to avoid omitted variable bias.

The *fifth hypothesis* analyzes the effect of different relational ties between donor and recipient on the selection probability. We found that the stronger the economic relationship between the two states, the more likely the receiving country is selected. This result confirms findings of previous aid allocation studies. However, political ties do not affect the selection probability at all. Strong cultural links visible in a common dominant language, for instance, increase the selection probability considerably. A common colonial experience as historic link has a significantly positive impact on the selection decision. This result, again, confirms findings of previous aid allocation studies. The geodesic distance between two states does not seem to guide the decision, but the geographic location appears to be decisive. With the exception of North American donors, countries on the African continent are much more likely to be selected than countries on any other continent. Concluding, economic, cultural and historic links between donor and recipient have a positive impact on the selection probability, while political ties and geographic proximity, ceteris paribus, could not be confirmed as important factors for the selection decision, although often argued otherwise.

## 7.3. Country selection decisions by the individual donors

The following analysis examines the motives underlying the country selection for health assistance for 22 bilateral donors, grouped into major, like-minded, and small donors. The major donors France, Germany, Japan, Spain, the United Kingdom and the United States are commonly regarded as pursuing their own political and strategic interests or as being bound by their colonial past (Svensson (1999): 291, 293).[98] The so-called like-minded donors Canada, Denmark, the Netherlands, Norway, and Sweden are traditionally viewed as being committed to the development needs of the recipient countries (Neumayer (2003a), 658).[99,100] The small donors have neither a reputation for promoting strategic interests, nor for promoting developmental needs.

The analysis focuses on the effect of the health circumstances in the recipient country on the selection decision for health assistance by the donor. Nevertheless, the quality of the institutional environment in the recipient country, the national efforts for the health system, and the donor-recipient bilateral relations are also controlled for as alternative decisive determinants.

### 7.3.1. Estimation approach

The estimation of the selection equation involves the estimation of a binary response model. Regression models for binary outcomes allow us to explore how each explanatory variable affects the probability of the event occurring. Due to the nonlinear model, the magnitude of the change in the outcome probability, that is associated with a given change in one of the regressors, depends on the levels of all regressors. The binary logit and binary probit models are the two most often used models. The dependent variable is the probability that a donor provides positive amounts of aid, the visible evidence for the recipient's selection.

The basic equation of the *panel probit model* used to test the hypotheses takes the following form:

$$Pr\left[DAH_{ijt} = 1 \middle| x_{ijt}\right] = Pr\left[DAH^{*}_{ijt} > 0 \middle| x_{ijt}\right] = \mathrm{F}(\mathrm{X_{RC}}, \mathrm{X_{BR}}) = \Phi\left[\alpha_i + \nu_t + \beta_r X^{RC}_{i,t-1} + \beta_m X^{BR}_{ij,t-1} + \mu_{ij,t-1}\right]$$

$$i = 1, \dots, 160; j = 1, \dots, 22;\ t = 1, \dots, 18$$

where *i* refers to the recipient, *j* refers to the donor and *t* refers to time, the dependent variable $DAH_{ijt}$ equals one if the latent variable $DAH^{*}_{ijt}$ is greater than zero, and zero otherwise, $\Phi$ is the cumulative standard normal distribution function, $\alpha_i$ are recipient-random-effects, $\nu_t$ are time-fixed-effects, $X^{RC}_{i,t-1}$ is a vector of recipient characteristics, $X^{BR}_{ij,t-1}$ is a vector of bilateral relations between donor and

[98] Typically, Italy is considered a big donor. Here, we have included Spain instead. As far as allocation of health assistance is concerned, Spain is a rather large donor with a provision of $1.3 billion.
The major donors represent almost 65% of total DAH in our sample. The like-minded donors account for around about 15% of total health aid, while the small donors represent the remaining share.

[99] In addition, the Netherlands and the Scandinavian donors Denmark, Norway and Sweden the only donors which consistently meet the United Nations recommended target of granting at least 0.7% of GDP as aid.

[100] When the selectivity choices are judged with respect to only one criterion, Denmark, Luxembourg, the Netherlands, Norway and Sweden are the most virtuous donors in terms of CPIA scores respectively preferential distribution of aid to LDCs (Amprou et al. (2007), 742-743).

recipient, and $\mu_{ij,t-1}$ is the disturbance term.[101] The error term $\mu_{ij,t-1}$ is assumed to be independent over *i*, but it may be correlated over *t* for given *i.* All explanatory variables are lagged by one year to model the decision-making process adequately.[102] The recipient random effects control for unobserved country heterogeneity that is assumed to be independently distributed of the regressors. Time fixed effects control for changes over time that affect all recipients equally.[103]

### 7.3.2. Results

Tables 13 and 14 report the estimation results for the probit models. Year-specific time dummies are included which allows each time period to have its own intercept, controlling for aggregate time effects that affect all receiving countries, such as the agreement on the MDGs in 2000. The reported coefficients are marginal effects because probit coefficients have no intuitive interpretation. The marginal effect is the change in the dependent variable per unit change in the independent variable. The probabilities are conditional on specific values of the independent variables because the logit model is nonlinear; marginal effects show the change in the probability following a marginal increase at the mean of the regressor with all other independent variables held at their average values as well (Powers and Xie (2008): 59-60).[104]

The estimation results for the control variables suggest that per capita income has a significantly negative effect on the selection probability of almost half the bilateral donors because the UK, the US, the Netherlands, Norway, Greece, Ireland and Luxembourg are more likely to select poorer recipients. The population size of the recipient has a significantly positive impact on the selection decision of almost every second donor, as in the case Germany, the UK, the US, Norway, Sweden, Finland and Ireland. We do not find any significant difference between the selection pattern of major donors, like-minded donors or small donors.

As regards health indicators, all like-minded donors are more likely to select a recipient country with a high prevalence rate of HIV. In addition, Sweden is also more likely to select a recipient with high under-five mortality; however, the effect is only marginal. The coefficients on maternal mortality suggest that Denmark, the Netherlands and Sweden are more likely to select recipients with low maternal mortality. Hence, the available evidence is not as clear as one would expect with respect to

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[101] In the trade literature, dyad fixed effects are increasingly used for analyzing dyadic trade flows; they control for distance, historical and cultural ties between states (e.g. Kerner (2009), 89).

[102] As decisions on aid allocation, respectively the country selection, are made prior to the actual disbursement of aid due to informational time lags, these variables are lagged in order to account for the type of information that was available to the decision-makers at that moment. The choice to lag the independent variables by one period is somewhat arbitrary. Other time lags have been used to test for robustness.

[103] See comments on fixed and random effects in chapter 6.4.

[104] The mean and variance adaptive Gauss-Hermite quadrature was performed first on every, and then on alternate iterations (StataCorp (2009), 432). The sensitivity of quadrature approximation used in the random-effects estimators has been checked by refitting the model for different numbers of quadrature points, and then comparing the different solutions. The random-effects logit model yields satisfactory results when the model is refitted with 24 integration points than the default 12 integration points. The relative difference of the coefficients does not change by more than 0.01 percent. In other words, the choice of quadrature points above the identified thresholds does not significantly affect the outcome. Thus, the results may be confidently interpreted.

like-minded donors. As regards the selection process of major donors, the HIV prevalence has a significantly positive effect on the selection probability by the UK and the US. As far as the US is concerned, this result is not surprising given the PEPFAR initiative and the prominent role of the United States as funder of antiretroviral drugs.[105] The evidence for Germany is ambiguous: on the one hand, under-five mortality has a significantly positive impact on the selection probability; on the other hand, the negative coefficient on maternal mortality suggests that countries with lower maternal mortality are more likely selected. The findings for France suggest that a recipient with low maternal mortality has greater selection chances. The evidence for small donors is rather mixed. Greece and Ireland are more likely to select a recipient with high HIV prevalence. While Austria, Belgium and Italy give also preference to these recipients, the negative coefficient on maternal mortality suggests that countries with low maternal mortality are more likely selected. Switzerland is more likely to select a recipient with high under-five mortality; however, the negative coefficient on maternal mortality means that countries with low maternal mortality are selected more likely.

In order to better understand the apparently negative influence of maternal mortality in some cases, we re-estimated the health indicators separately for each individual donor. Under-five mortality continues to have a significantly marginal positive effect or to be insignificant. HIV prevalence continues to have a significantly positive effect on the selection decision of many individual donors. As expected, maternal mortality has no significant impact on the selection probability in most cases, when estimated in isolation. In the case of Spain, Canada and Ireland, in turn, the maternal mortality rate has a significantly positive effect, when estimated individually. The separate estimation of the three health indicators also reveals that any health indicator has a significant impact on the selection decision of Austria, Italy and Switzerland. In the case of Spain, however, the three health indicators have a significantly positive impact, when estimated separately.

In summary, HIV prevalence, as only health indicator, consistently influences the individual selection decisions of most donors. Under-five mortality influences the selection probability only marginally, and only in few cases. Maternal mortality is the health indicator with the most inconsistent effect. The indicator on HIV prevalence is the key indicator for the selection decisions by like-minded donors. Contrary to common expectations, however, their decisions are not consistently based on health indicators in general, even when estimated in isolation. Hence, the selection decisions for health assistance are not consistently based on poor health indicators; neither with respect to single donors nor with donor groups.

The results for the proxies of the institutional environment of the recipient are mixed. Spain and the US are more likely to select a recipient with greater economic freedom. France is more likely to select countries with less economic freedom. The German selection decision does not appear to be influenced by institutional factors. The UK seems to give preference to more democratic but also more

[105] PEPFAR is The United States President's Emergency Plan for AIDS Relief. PEPFAR focus countries for the period under consideration were Botswana, Cote d'Ivoire, Ethiopia, Guyana, Haiti, Kenya, Mozambique, Namibia, Nigeria, Rwanda, South Africa, Tanzania, Uganda, Vietnam, Zambia.

corrupt countries. The former effect is however only marginal. Denmark is more likely to select more democratic, freer and less corrupt countries. Canada appears to select more corrupt countries with greater probability. The Dutch selection decision seems to be guided by the democracy level of the recipient – a democratic recipient has greater chances. Norway gives preference to economic free, but also more corrupt recipients. The institutional quality of the recipient is insignificant for the Swedish selection decisions. Hence, the selection pattern for like-minded donors is more heterogeneous than expected. The institutional environment is insignificant for the selection procedure of the small donors Belgium, Greece and Luxembourg. Austria is more likely to select recipients with greater economic freedom, but also a more autocratic government. Finland gives preference to more democratic recipients. Ireland is more likely to select less free countries. Less economic freedom seems to increase the selection probability by Italy, while more autocratic conditions have a positive effect on the Swiss selection decision.

The expenditures for the national health system cause two opposing reactions by the donors. Denmark, the Netherlands and Austria are less likely to select a recipient country with high expenditures. However, France, Luxembourg and Italy seem to give preference to such recipients. National health expenditures are insignificant for the decision-making process of all other donors. The immunization coverage rate in a recipient country has a significantly positive effect on the selection decision by Sweden and Switzerland but a significantly negative effect on the selection by the UK. The magnitude of the effect is rather marginal. The selection process for health assistance is hence little affected by health expenditures and immunization rates.

The importance of bilateral relations for the selection decision differs among donors and across donor groups. France is more likely to select a recipient to whom it exports, that is politically integrated and was a former French colony.[106] The US is geographically biased in its selection decision as it selects geographically close recipients more likely. The coefficient on political integration suggests that preference is given to less integrated countries. Spain also selects recipients, with whom it has strong export links, more likely. The UK seems to give preference to politically less integrated countries; yet with small economic significance. Similar to France, the British decision is biased by colonial ties; a former colony is more likely to be selected for health assistance. Bilateral relations seem to be insignificant for the German decision process. As far as the like-minded donors are concerned, Canada is the only donor whose selection decision is influenced by bilateral relations. It is geographically biased and selects closer recipients with greater probability. Politically more integrated countries are marginally more likely to be selected. The selection probability for the recipient is significantly increased by economic links. Bilateral relations are only relevant for few small donors. Belgium seems to slightly prefer politically integrated countries. However, the evidence suggests that it is also more likely to select socially less integrated recipients. Italy and Greece are geographically

[106] In the case of Spain and the United States, we tested additionally for the influence of a colonial relationship between other donors and recipients. Contrary to our expectations, we did not find any evidence that these recipient countries are less likely to be selected.

biased and more likely to select close recipients. In addition, the selection probability by Greece is higher for socially integrated countries but lower for politically integrated recipients. In general, we cannot find any evidence for a systematic difference among donor groups as regards the importance of links between donor and recipient. Yet, for many donors the bilateral relations are not decisive when it comes to selecting potential recipients for health assistance.[107]

[107] It has been argued that donors do not decide independently from other donors in the aid allocation literature (e.g. Berthélemy and Tichit (2004), Berthélemy (2006), Younas (2008), Claessens et al. (2009), Hoeffler and Outram (2011)). Thus, it would have been desirable to control for the effect of the selection decisions by multilateral donors or the leading bilateral donor United States. However, it seems more likely that these factors might determine the actual allocation of health assistance but much less the selection decision. In addition, since the first step of the decision-making process is estimated via maximum likelihood, these variables could not be controlled for due to computational complications. One may argue that donors' preferences such as expenditures, political transparency or social inequality affect the decision-making process (e.g. Faust (2010), Chong and Gradstein (2008)). For disaggregate analyses, such control variables would only make sense if the recipient's perspective were taken. In this case, one would want to control for differences among individual bilateral donors. In our disaggregate analysis, the donor's perspective is taken and hence we control for recipients' characteristics and bilateral relations between donor and recipient.

Table 13. Estimation results: Selection decisions of major donors and like-minded donors

| | Major donors | | | | | Like-minded donors | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | France | Germany | Spain | UK | USA | Canada | Denmark | Netherlands | Norway | Sweden |
| *Control variables* | | | | | | | | | | |
| (ln) GDPpc | 0.0343 | -0.0056 | -0.0961 | -0.1102* | -0.1213* | -0.3227*** | -0.1443 | -0.1152 | -0.1120 | -0.0311 |
| | (0.47) | (-0.08) | (-1.62) | (-2.00) | (-2.37) | (-4.38) | (-1.46) | (-1.65) | (-1.67) | (-0.56) |
| (ln) Population | -0.0285 | 0.0975 | 0.0671 | 0.1731** | 0.0675 | 0.0511 | 0.0746 | 0.0519 | 0.1217* | 0.0685* |
| | (-0.74) | (1.65) | (1.45) | (2.88) | (1.73) | (1.03) | (0.84) | (0.97) | (2.37) | (2.00) |
| *Health indicators* | | | | | | | | | | |
| Under-five mortality | 0.0015 | 0.0059* | 0.0008 | -0.0006 | 0.0004 | -0.0014 | 0.0017 | 0.0014 | -0.0001 | 0.0021* |
| | (0.89) | (2.07) | (0.52) | (-0.42) | (0.28) | (-0.84) | (0.66) | (0.73) | (-0.11) | (2.00) |
| Maternal mortality | -0.0332 | -0.0456* | 0.0157 | -0.0067 | -0.0160 | 0.0059 | -0.0583 | -0.0541 | -0.0271 | -0.0249 |
| | (-1.78) | (-2.05) | (0.90) | (-0.40) | (-1.05) | (0.28) | (-1.86) | (-1.90) | (-1.53) | (-1.93) |
| HIV prevalence | 0.0093 | 0.0042 | 0.0072 | 0.0174* | 0.0222** | 0.0367*** | 0.0404** | 0.0519** | 0.0552* | 0.0417** |
| | (1.39) | (0.69) | (1.07) | (2.44) | (3.07) | (3.68) | (3.00) | (2.87) | (2.55) | (3.08) |
| *Environment* | | | | | | | | | | |
| Democracy | -0.0084 | 0.0007 | 0.0011 | 0.0066 | 0.0022 | 0.0097 | 0.0151 | 0.0138* | 0.0052 | 0.0009 |
| | (-1.56) | (0.17) | (0.19) | (1.65) | (0.55) | (1.53) | (1.74) | (2.45) | (0.99) | (0.23) |
| Economic freedom | -0.0895 | 0.0292 | 0.0798* | -0.0176 | 0.0528 | 0.0483 | 0.0904 | -0.0610 | 0.0975 | 0.0559 |
| | (-1.92) | (0.56) | (1.97) | (-0.51) | (1.82) | (1.01) | (1.31) | (-1.30) | (1.74) | (1.38) |
| Rights and liberties | -0.0112 | -0.0088 | -0.0125 | -0.0048 | -0.0027 | -0.0188 | 0.0496* | -0.0074 | 0.0252 | 0.0122 |
| | (-0.73) | (-0.67) | (-0.83) | (-0.42) | (-0.39) | (-1.42) | (2.08) | (-0.61) | (1.60) | (1.13) |
| CPI | 0.0225 | 0.0014 | -0.0063 | 0.0188* | 0.0044 | 0.0215 | -0.0518* | -0.0038 | 0.0441* | -0.0103 |
| | (1.25) | (0.15) | (-0.56) | (2.21) | (0.73) | (1.72) | (-2.15) | (-0.35) | (2.35) | (-0.95) |
| *Effort* | | | | | | | | | | |
| Health expenditures | 0.0829 | -0.0004 | 0.0245 | -0.0384 | -0.0403 | 0.0295 | -0.1302* | -0.1559* | -0.0049 | -0.0087 |
| | (1.85) | (-0.01) | (0.69) | (-1.32) | (-1.61) | (0.81) | (-2.37) | (-2.40) | (-0.12) | (-0.29) |
| Immunization | 0.0012 | 0.0008 | -0.0026 | -0.0047* | -0.0005 | -0.0022 | 0.0017 | -0.0020 | -0.0006 | 0.0048* |
| | (0.51) | (0.35) | (-1.20) | (-2.37) | (-0.38) | (-0.98) | (0.56) | (-0.85) | (-0.34) | (2.39) |
| *Bilateral relations* | | | | | | | | | | |
| (ln) Exports | 0.0615* | -0.0274 | 0.0476 | -0.0372 | 0.0195 | 0.0656 | 0.0238 | 0.0148 | -0.0107 | 0.0176 |
| | (1.96) | (-0.47) | (1.88) | (-1.44) | (0.71) | (1.89) | (0.42) | (0.34) | (-0.60) | (0.81) |
| Political integration | 0.0083* | -0.0014 | 0.0015 | -0.0047 | -0.0049* | 0.0052* | -0.0053 | 0.0033 | -0.0043 | -0.0033 |
| | (2.40) | (-0.61) | (0.51) | (-1.65) | (-2.54) | (2.02) | (-1.24) | (1.07) | (-1.33) | (-1.58) |
| Social integration | -0.0055 | -0.0030 | -0.0002 | 0.0012 | 0.0015 | 0.0039 | -0.0016 | 0.0047 | -0.0100 | -0.0009 |
| | (-1.26) | (-0.69) | (-0.04) | (0.21) | (0.53) | (0.75) | (-0.20) | (0.90) | (-1.39) | (-0.24) |
| (ln) Own colony | 0.1052* | 0.0632 | | 0.0541 | | | | 0.0133 | | |
| | (2.52) | (1.00) | | (1.74) | | | | (0.18) | | |
| (ln) Distance | -0.1261 | 0.0513 | -0.1149 | 0.0015 | -0.1882* | -0.3301** | 0.2547 | 0.0459 | -0.0375 | -0.0280 |
| | (-1.13) | (0.53) | (-1.36) | (0.01) | (-2.44) | (-2.96) | (0.96) | (0.33) | (-0.31) | (-0.33) |
| Observations | 300 | 300 | 299 | 300 | 478 | 478 | 290 | 300 | 289 | 290 |
| No. of groups | 49 | 49 | 49 | 49 | 68 | 68 | 46 | 49 | 46 | 46 |
| log likelihood | -77.7875 | -35.7786 | -80.4737 | -64.2079 | -116.2480 | -178.5490 | -81.1701 | -103.4407 | -58.2759 | -53.7874 |
| Chi-squared | 32.2144 | 11.5171 | 27.5527 | 20.1616 | 38.7419 | 83.5736 | 26.4851 | 34.0923 | 12.9023 | 17.8604 |

Dependent variable is selection probability (1 = receives aid; 0 = does not receive aid). Estimates are based on the logit maximum likelihood procedure, Gauss-Hermite adaptive quadrature with 24 quadrature points. Robust standard errors. All equations include year-specific time dummies. Coefficient of constant not reported. t-statistics are reported below the marginal coefficient estimates. All time-varying regressors are lagged by one year. ***, **, * denote significance at 0.1, 1, and 5 percent, respectively. Note also that the sample varies between rows because of data availability for some variables. Japan could not be estimated due to computational problems.

Table 14. Estimation results: Selection decisions of small donors

| | Small donors | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Austria | Belgium | Finland | Greece | Ireland | Italy | Luxembourg | Switzerland |
| *Control variables* | | | | | | | | |
| (ln) GDPpc | -0.1072 | -0.0924 | -0.0262 | -0.1366* | -0.2062** | -0.1141 | -0.1371 | -0.0339 |
| | (-1.32) | (-1.38) | (-0.30) | (-2.57) | (-3.01) | (-1.54) | (-1.93) | (-0.44) |
| (ln) Population | 0.0568 | 0.0421 | 0.1545* | 0.0443 | 0.0701 | -0.0183 | -0.0063 | 0.0526 |
| | (1.08) | (0.80) | (2.46) | (1.41) | (1.77) | (-0.42) | (-0.17) | (0.74) |
| *Health indicators* | | | | | | | | |
| Under-five mortality | -0.0003 | 0.0003 | -0.0002 | 0.0006 | 0.0007 | -0.0003 | 0.0016 | 0.0049* |
| | (-0.18) | (0.20) | (-0.10) | (0.55) | (0.56) | (-0.23) | (1.11) | (2.16) |
| Maternal mortality | -0.0488* | -0.0381* | -0.0271 | -0.0012 | -0.0202 | -0.0291 | -0.0135 | -0.0665* |
| | (-2.15) | (-2.07) | (-1.10) | (-0.10) | (-1.32) | (-1.89) | (-0.80) | (-2.21) |
| HIV prevalence | 0.0255** | 0.0284** | 0.0132 | 0.0221*** | 0.0331*** | 0.0115 | -0.0047 | 0.0112 |
| | (2.82) | (2.99) | (1.27) | (3.48) | (3.81) | (1.69) | (-0.58) | (1.08) |
| *Environment* | | | | | | | | |
| Democracy | -0.0187* | -0.0001 | 0.0116 | -0.0093 | 0.0005 | 0.0015 | -0.0017 | -0.0156* |
| | (-2.45) | (-0.01) | (1.71) | (-1.51) | (0.09) | (0.31) | (-0.23) | (-2.18) |
| Economic freedom | 0.1141* | -0.0135 | -0.0830 | 0.0700 | -0.0071 | -0.1463* | 0.1156 | 0.0263 |
| | (1.98) | (-0.28) | (-1.28) | (1.53) | (-0.13) | (-2.35) | (1.56) | (0.51) |
| Rights and liberties | 0.0050 | -0.0046 | -0.0042 | -0.0148 | -0.0291 | -0.0131 | -0.0108 | 0.0072 |
| | (0.26) | (-0.28) | (-0.26) | (-1.05) | (-1.89) | (-0.86) | (-0.69) | (0.39) |
| CPI | -0.0143 | 0.0008 | -0.0214 | -0.0210 | 0.0015 | -0.0186 | 0.0234 | -0.0060 |
| | (-0.87) | (0.07) | (-1.64) | (-1.41) | (0.13) | (-1.57) | (1.49) | (-0.41) |
| *Effort* | | | | | | | | |
| Health expenditures | -0.0915 | 0.0009 | 0.0393 | -0.0438 | 0.0087 | 0.0721 | 0.1030* | -0.0447 |
| | (-1.83) | (0.03) | (0.94) | (-1.27) | (0.21) | (1.81) | (2.26) | (-0.78) |
| Immunization | -0.0025 | -0.0011 | -0.0007 | -0.0009 | -0.0008 | -0.0011 | 0.0025 | 0.0073** |
| | (-0.85) | (-0.50) | (-0.29) | (-0.45) | (-0.41) | (-0.59) | (1.02) | (2.74) |
| *Bilateral relations* | | | | | | | | |
| (ln) Exports | -0.0284 | 0.0286 | 0.0161 | 0.0014 | 0.0189 | 0.0421 | 0.0185 | -0.0275 |
| | (-0.87) | (0.77) | (0.58) | (0.10) | (0.91) | (1.21) | (0.78) | (-0.69) |
| Political integration | 0.0042 | 0.0061 | -0.0041 | -0.0045 | -0.0013 | 0.0046 | 0.0037 | 0.0008 |
| | (1.14) | (1.92) | (-1.17) | (-1.86) | (-0.49) | (1.63) | (1.12) | (0.23) |
| Social integration | -0.0075 | -0.0150* | -0.0097 | 0.0132** | 0.0015 | -0.0082 | -0.0030 | -0.0053 |
| | (-1.09) | (-1.98) | (-1.38) | (2.65) | (0.30) | (-1.50) | (-0.52) | (-0.71) |
| (ln) Own colony | | | | | | | | |
| | | | | | | | | |
| (ln) Distance | 0.0252 | -0.1688 | 0.2495 | -0.3289** | -0.0023 | -0.2650* | 0.0288 | 0.0733 |
| | (0.22) | (-1.37) | (0.97) | (-3.29) | (-0.03) | (-2.22) | (0.31) | (0.59) |
| | | | | | | | | |
| Observations | 300 | 300 | 289 | 294 | 300 | 300 | 287 | 300 |
| No. of groups | 49 | 49 | 46 | 49 | 49 | 49 | 48 | 49 |
| log likelihood | -132.6391 | -88.6570 | -104.1350 | -67.1441 | -89.1633 | -75.0777 | -86.4892 | -106.7323 |
| Chi-squared | 46.1534 | 30.9062 | 31.5369 | 28.1288 | 36.3980 | 25.9815 | 29.9333 | 30.5449 |

Dependent variable is selection probability (1 = receives aid; 0 = does not receive aid). Estimates are based on the logit maximum likelihood procedure, Gauss-Hermite adaptive quadrature with 24 quadrature points. Robust standard errors. All equations include year-specific time dummies. Coefficient of constant not reported. t-statistics are reported below the marginal coefficient estimates. All time-varying regressors are lagged by one year. ***, **, * denote significance at 0.1, 1, and 5 percent, respectively. Note also that the sample varies between rows because of data availability for some variables. Australia, Portugal and New Zealand could not be estimated due to missing variation.

Table 15 summarizes the estimation results for selection decisions of major, like-minded and small donors. Health indicators influence the selection decision of like-minded and small donors most strongly. Keeping the robustness results in mind, HIV prevalence is the only health indicator that consistently affects the selection process for health assistance recipients. Per capita income and population size have a similar impact on the decision-making process of all donor groups. The institutional environment affects the selection decisions of like-minded donors more than of major donors. It does not seem of much importance to small donors. The recipients' efforts, measured by the national health expenditures and the immunization coverage rate, do not significantly influence the selection decisions of almost all donors. Bilateral relations are predominantly important for the selection process of major donors. Like-minded donors are not influenced by such factors with the exception of Canada. Other aspects are important for most small donors.

Table 15. Overview of estimation results for selection decisions of major, like-minded and small donors

| | **Major donors** | | | | | **Like-minded donors** | | | | | **Small donors** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | France | Germany | Spain | UK | US | Canada | Denmark | NL | Norway | Sweden | Austria | Belgium | Finland | Greece | Ireland | Italy | LUX | CHE |
| *Control variables* | | | | | | | | | | | | | | | | | | |
| (ln) GDPpc | | | | - | - | - | | - | - | | | | | - | - | | - | |
| (ln) Population | | + | | + | + | | | | + | + | | | + | | + | | | |
| *Health indicators* | | | | | | | | | | | | | | | | | | |
| Under-five mortality | | + | | | | | | | | + | | | | | | | | + |
| Maternal mortality | - | - | | | | | - | - | | - | - | - | | | | - | | - |
| HIV prevalence | | | | + | + | + | + | + | + | + | + | + | | + | + | + | | |
| *Environment* | | | | | | | | | | | | | | | | | | |
| Democracy | | | | + | | | + | + | | | - | | + | | | | | |
| Economic freedom | - | | + | | + | | | | + | | + | | | | | - | | |
| Rights and liberties | | | | | | | + | | | | | | | + | - | | | |
| Corruption | | | | + | | + | - | | + | | | | | | | | | |
| *Effort* | | | | | | | | | | | | | | | | | | |
| Health expenditures | + | | | | | | - | - | | | - | | | | | + | + | |
| Immunization | | | | - | | | | | | + | | | | | | | | + |
| *Bilateral relations* | | | | | | | | | | | | | | | | | | |
| (ln) Exports | + | | + | | | + | | | | | | | | | | | | |
| Political integration | + | | | - | - | + | | | | | | + | | - | | | | |
| Social integration | | | | | | | | | | | | - | | + | | | | |
| (ln) Own colony | + | | | + | | | | | | | | | | | | | | |
| (ln) Distance | | | | | - | - | | | | | | | | - | | - | | |
| Observations | 300 | 300 | 299 | 300 | 478 | 478 | 290 | 300 | 289 | 290 | 300 | 300 | 289 | 294 | 300 | 300 | 287 | 300 |

Note: (+) = significant positive effect, (-) = significant negative effect; UK = United Kingdom, US = United States, NL = Netherlands, LUX = Luxembourg, CHE = Switzerland.

### 7.3.3. Sensitivity analysis

The first robustness test replaced per capita income with the Human Development Index (HDI) as more general development indicator, since countries with similar income can be very different in their human development (UNDP (1999), 129). When controlling for the general level of development, the results remain largely the same. Norway and Luxembourg are the only donors that are more likely to select less developed countries. Spain, Canada and Greece give preference to more populous countries. The population size of the recipient does no longer have a significant impact on the German selection decision. The results for the health indicators suggest that HIV prevalence has a significantly positive effect on the selection decision by all like-minded donors and most major respectively small donors. Maternal mortality continues to have, predominantly, a significantly negative effect. The under-five mortality continues to be insignificant, with the exception of Germany, whose coefficient suggests a positive effect. As regards the institutional environment, the results are largely unaffected. The Netherlands is less likely to select a recipient with greater economic freedom, while Norway is more likely to select a country with more rights and liberties. Finland and Greece are less likely to select corrupt recipients. The coefficients on the indicators of recipients' efforts remain largely the same. The United States and Greece are less likely to select a country with high national health expenditures. The only remarkable change, in terms of bilateral relations, is that social integration of the recipient decreases the selection probability by Norway, Austria and Finland.

A different time lag of two years affects some coefficients but does not change the general results. Two thirds of the donors are more likely to select poor recipients. Only Norway, Sweden and Finland are more likely to select more populous countries. As regards health indicators, HIV prevalence has a significantly positive impact on the selection probability of most donors. If maternal mortality is significant, the coefficients suggest a significantly negative impact, with the exception of Spain. Under-five mortality is insignificant for the selection decisions, except Sweden and Switzerland. However, the economic significance is only marginal and not comparable to the effects of other health indicators. The variables that are most sensitive to a change in the time lag are the proxies of the institutional environment. Rights and liberties only have a significantly positive effect on the US selection decision. Economic freedom increases the selection probability in the case of the US and Sweden, but decreases it in the case of France. The level of democracy has only a significantly positive impact on the Dutch selection decision. Corruption becomes insignificant for the selection decision of major and like-minded donors. As far as small donors are concerned, the coefficients for the institutional variables change only in the case of Greece, which is more likely to select less democratic and less corrupt recipients. When a longer time lag is used, the statistical significance of the recipients' efforts disappears. Even if health expenditures and immunization coverage have a statistically significant effect, the economic significance is only marginal. Except for Luxembourg, in which case the national health expenditures have a significantly negative effect on the selection

decision. As regards bilateral relations, the most remarkable difference is that economic links have a statistically and economically significantly positive effect on the selection probability of many donors. The other changes are only small in magnitude.

Third, we dropped transition countries from our sample in order to test for possible outliers. The results remain largely unaffected. Per capita income has no significant effect on the selection decision by the Netherlands and Norway. Maternal mortality is insignificant for the French selection for health assistance. The only noteworthy changes with respect to the importance of the institutional environment are that corruption is insignificant for the Canadian decision but has a significantly negative effect on the Finish and Italian decision. In other words, in the latter cases, more corrupt countries are less likely selected. Economic freedom has a significantly positive impact on the selection decision by Luxembourg. The recipients' health expenditures have no significant impact on the Austrian selection probability. As regards bilateral relations, the only change is that political integration is now insignificant for the decision-making by the UK, Belgium and Greece. All other coefficient estimates remain the same.

### 7.3.4. Concluding remarks

The disaggregate analysis of the individual behavior of major, like-minded and small donors reveals the decision-making process to be very heterogeneous across donors and donor groups. However, a certain pattern emerges. First, HIV prevalence is the most significant health indicator for all donors. It seems that public attention and pressure lead donors to perceive HIV/Aids as an important problem. The equally high ranked global health problems, under-five mortality and maternal mortality, are apparently much less of an issue when recipients for health assistance are selected. Second, like-minded donors are most influenced by health indicators and the institutional environment. Third, major donors are influenced by bilateral relations, in addition to health indicators and the institutional environment. Fourth, with the exception of the HIV indicator, no consistent pattern for small donors emerges. Contrary to previous research (e.g. Alesina and Dollar (2000)), the results do not provide any evidence that like-minded donors fare better at discriminating corrupt recipient countries.

The results for the control variables income level and population size of the receiving country reveal differences and similarities across donors. One out of two bilateral donors is more likely to select a poor recipient country, and respectively a more populous recipient country. The selection decision of the UK, the US, Norway and Ireland is influenced by both variables. Hence, three patterns of individual donor behavior with respect to these two control variables can be identified: preference for poor countries, preference for populous countries, and preference for poor and populous countries.

One of the motivating questions of this analysis is to what extent the selection decisions for bilateral health assistance are based on poor health indicators. High prevalence of HIV has a positive effect on the selection probability by the major donors UK and US, all like-minded donors and most

small donors. The available evidence suggests that like-minded donors systematically select recipients whose neediness is apparent in poor health indicators – at least as far HIV/Aids is concerned. Yet, most other donors behave very similarly. Consequently, the selection pattern does not seem to be a unique feature of like-minded donors. The findings for the other health indicators under-five mortality and maternal mortality are less consistent. On the one hand, according to the general estimation results, under-five mortality has a significantly positive impact in some cases, while maternal mortality has a significantly negative impact. On the other hand, according to a robustness test which estimates the health indicators separately in our model, under-five mortality and maternal mortality have a significant impact on the selection decisions in some cases. This means that only one of the three health indicators, the prevalence rate of HIV, consistently influences the individual selection decisions. HIV/Aids appears as dominant theme which crowds other global health problems out such as high maternal mortality or high under-five mortality, although all three are single and equal objectives of the development agenda.

The results for the extent to which a selection decision is based on a favorable environment as indicator of relatively strong institutions are mixed. Some donors select democratic countries more often, while others give preference to autocratic countries. Economic freedom increases but also decreases the selection probability while the general level of freedom is basically insignificant for the decision. The extent of corruption increases selection probability in some cases, while it decreases selection chances in others. In other words, the significance and magnitude of proxies for institutional quality varies across donors and among donor groups. The findings also illustrate that the selection decisions of many donors are not affected by proxies for the quality of the institutional environment in a recipient country. There is no evidence that like-minded donors, for instance, select consistently democratic, freer and less corrupt recipients.

The financial efforts of recipients for their national health system lead to two opposite reactions by the donors. Some donors are less likely to select recipients with high health expenditures, while others give preference to such recipients. The immunization coverage increases selection chances by Sweden and Switzerland but decreases the selection probability by the UK; however, the magnitude of the effect is only marginal. In general, health expenditures are more important for the selection decision of bilateral donors. The results do not suggest any systematic difference in selection patterns among donor groups.

The effect of bilateral relations on the decision-making process varies across donors. France, Spain and Canada prefer recipients with commercial links in the form of exports. France and the UK are positively influenced by former colonial ties. The geodesic distance between the donor and the recipient influences the selection process of the US, Canada, Greece and Italy, which are more likely to select geographically closer recipients. The effects of political and social integration on the selection probability are only of marginal size. The selection decision of small donors is much less influenced

by bilateral relations than those of major donors. The decision-making process of like-minded donors, except Canada, is not affected by relational links.

## 7.4. Conclusion

Previous studies on aid allocation with a separate analysis of the selection and the allocation decision are relatively scarce. Among the little available evidence, few analyses report or interpret their results for the selection stage. These studies find different driving forces for the two-step decision-making process of selection and allocation. Yet, the potential influential factors included in these analyses are few.

Our study provides a detailed analysis of the determinants of the country selection decisions by the average donor, as well as by individual donors with respect to the health sector. We test for the importance of health and development indicators, the quality of the institutional environment in the receiving country, the recipient's efforts with respect to the national health system and the relational ties between donor and recipient as potential underlying motives for the selection decision of health assistance. In addition, we test for the importance of strategic interaction among donors in the aggregate analysis of the selection behavior of the average donor. The dataset contains dyadic data on flows of health assistance from a maximum of 22 donors to a maximum of 160 recipients between 1990 and 2007. The results of the analysis for the average donor show that many factors, varying in importance, determine the selection of a country as recipient. The disaggregate analysis for the individual donor shows that the motivations for selection are heterogeneous across donors. The results also provide evidence that there is little systematic difference between major, like-minded and small donors.

The principal question of the previous analyses on the determinants for selection is, to what extent the decision to select a recipient for health assistance is based on health indicators. The results of the aggregate analysis show that high under-five mortality increases the selection probability marginally, and that high HIV prevalence has a consistent positive effect on the average selection decision, but that the effect of maternal mortality is inconsistent. The disaggregate analysis of individual donor behavior reveals that only the prevalence rate of HIV consistently increases the selection probability.

The quality of the institutional environment is only of little importance for the selection decision by the average donor. A recipient with greater economic freedom is more likely to be selected, while the level of corruption, the rights and liberties or the effectiveness of the recipient's government is irrelevant for the selection decision by the average donor. The available evidence for the individual donor behavior, however, reveals that the significance and the magnitude of proxies for institutional quality vary across bilateral donors and among groups of bilateral donors.

The investments in public health by the recipient have a very different effect on the selection probability by the average donor and by individual donors. National public health expenditures and

immunization rates are insignificant for the selection decision by the average bilateral donor. Some bilateral donors, however, give preference to recipients with high health expenditures, while others select these countries less likely. Immunization coverage has no substantial effect on the selection decisions by individual bilateral donors.

The effect of relational ties between donor and recipient on the selection probability is diverse. The results of the aggregate analysis show that economic, cultural and historic links are favorable for the selection probability, while political ties and geographic proximity are irrelevant. The disaggregate analysis of individual donor behavior reveals that economic, historic and geographic links primarily drive the selection decision. In general, bilateral relations influence the selection decision of major donors very much, while they are less important for small donors. Like-minded donors, except Canada, are not affected by relational links.

The relative importance of the donor matters for the selection decision taken by the average donor. Hence, bilateral donors act strategically and do not decide independently from others. The selection decision by the US, as most important donor, is particularly decisive for the selection decision of the average bilateral donor as regards populous recipient countries.

# Chapter 8
# Aid allocation

## 8.1. Introductory remarks

The literature review emphasized that many factors affect the decision of the average donor to allocate aid to a selected recipient. It also showed that the same factor has a different effect on the allocation decision of the individual donor. This chapter builds on these insights, focusing on the allocation decision for health assistance by the average donor and by individual donors.

## 8.2. Allocation decisions by the average donor

Donor's characteristics, recipient's characteristics and bilateral relations between donor and recipient present potential determinants of aid allocation decisions. The following analysis examines the effect of health indicators on the allocation decision of the (hypothetic) average bilateral donor. Eleven hypotheses classified in six groups test for the relevance of different factors such as indicators on recipient need, the quality of the institutional environment, efforts regarding the national health system, potential competition among donors, the programmatic preferences of donors and the donor-recipient relationship.[108]

### 8.2.1. Estimation approach

The basic equation of the *panel model* used to test the hypotheses takes the following form:

$$\ln\left(DAH_{ijt}\right) = \left[\alpha_i + \nu_t + \beta_d X^{DC}_{j,t-1} + \beta_r X^{RC}_{i,t-1} + \beta_m X^{BR}_{ij,t-1} + \mu_{ij,t-1}\right], DAH_{ijt} > 0$$

$$i = 1, \dots, 160; j = 1, \dots, 22;\ t = 1, \dots, 18$$

where $i$ refers to the recipient, $j$ refers to the donor and $t$ refers to time. The dependent variable $\ln\left(DAH_{ijt}\right)$ represents the logarithm of development assistance for health from donor $j$ to recipient $i$ in year $t$.[109,110] $\alpha_i$ are recipient-random-effects, $\nu_t$ are time-fixed-effects, $X^{DC}_{j,t-1}$ is a vector of donor

[108] The hypotheses are summarized in Table 3 at the end of chapter 4.

[109] We use constant 2007 dollars in order to adjust for inflation because aid given in 1990 corresponds to higher values in 2007 dollars. As all financial data are recorded in US dollars, there was no need to make currency conversions.

[110] The correct form of aid as dependent variable has been disputed in the aid literature. Total amounts of aid represent the absolute commitment of a donor to a recipient; measured as a share of GDP, the size relative to the entire economy is revealed as well as the recipient's dependence; per capita measures indicate the magnitude of aid transfers relative to the population size and thus represent the relative commitment of a donor (Radelet (2006), 5). Whereas total aid provides a close approximation to the decision-making process in practice, aid per capita controls for the different population sizes of receiving countries. Yet, aid committed as percentage of total donor's aid has also been taken as dependent variable in order to best approximate the donor's decision-making because it seems reasonable to assume a predetermined pool of resources for allocation (Neumayer (2003b), 42). It implies that decision makers may be aware of the corresponding per

characteristics, $X_{i,t-1}^{RC}$ is a vector of recipient characteristics, $X_{ij,t-1}^{BR}$ is a vector of bilateral relations between donor and recipient, and $\mu_{ij,t-1}$ is the disturbance term.[111] The error term $\mu_{ij,t-1}$ is assumed to be independent over *i*, but it may be correlated over *t* for given *i* (hence, it is assumed to be independent across countries but not necessarily within countries over time). All explanatory variables are lagged by one year to adequately model the decision-making process.[112] The recipient random effects control for unobserved country heterogeneity that is assumed to be independently distributed of the regressors. Time fixed effects control for changes over time that impact all recipients equally.[113]

### 8.2.2. Results

In Table 16, the estimation results for the first hypothesis are presented.[114] The coefficients are the elasticities of aid with respect to the respective independent variable.[115] The results of the base estimation show that more aid is allocated to poorer countries: a 10% decrease in per capita income is associated with a 4.5% increase in aid. For the average donor, the small country bias cannot be confirmed with respect to health assistance: a 10% increase in population size is associated with a 1% increase in allocated aid. Economic links to the donor, the democracy level of the recipient and a recipient's colonial history have a significantly positive impact on aid allocations for health on average. The geographic bias cannot be confirmed in terms of health aid: a 10% increase in the distance between donor and recipient is associated with a 6.3% increase in allocations by the average donor.

In column (2) under-five mortality was added. The coefficient is insignificant and only marginally different from zero. In column (3) maternal mortality was added. The coefficient suggests that a one unit increase is associated with a 4.7% increase in aid. HIV prevalence was added in column (4). The coefficient suggests that a one unit increase is associated with a 3.4% increase in aid. However, when we control for all three health indicators simultaneously in column (5), only the prevalence of HIV has

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capita amounts but, consequently, "per capita aid allocations are viewed as the outcome of this process rather than the prime consideration" (McGillivray and Oczkowski (1992), 1314). Therefore, the choice of per capita aid commitments as dependent variable is controversial because there is a strong argument that absolute aid is the decision variable of donors (McGillivray (2003b), 182).

For a concise treatment of the different forms of the dependent variable, please refer to Kilby (2006), 177.

111 In the trade literature, dyad fixed effects are increasingly used for analyzing dyadic trade flows; they control for distance, historical and cultural ties between states (e.g. Kerner (2009): 89).

112 The technique makes sense as information to the donors about a recipient is only available with some time lag. The choice to lag the independent variables by one period is somewhat arbitrary. Other time lags have been used to test for robustness.

113 See comments on fixed and random effects in chapter 6.4.

114 The sample varies between columns because of data availability for some variables. It is usually emphasized that the number of observations should be the same across columns in order to guarantee the comparability of the results. We double checked our results by re-estimating them using the smallest number of observations used in one of the columns as base for all other estimations of the same hypothesis. In all cases, the results for all hypotheses were unaffected. The significance and sign of the coefficients remained the same. The coefficient estimates changed only marginally in the first and second decimal places. As an exception, with respect to hypothesis five, political transparency had a consistent significantly negative effect on aid allocation. Yet, the number of observations was only a fifth of the observations used in the original results.

115 In a log-log model, the coefficient $\beta_1$ is interpreted as such that a 1% change in *X* is associated with a $\beta_1$% change in *Y* (Stock and Watson (2007), 273).

a significantly positive impact on aid. A one unit increase is associated with a 3.2% increase in allocated health aid. The hypothesis that donors allocate health assistance according to poor health indicators of recipient countries can thus only be partly confirmed. Contrary to public statements, under-five mortality and maternal mortality do not significantly influence these allocation decisions. However, the prevalence of HIV does have a significantly positive impact on the aid decisions.

Table 16. Estimation results for need and development indicators, allocation decision by average donor

| | **Base** | **Hypothesis B.1** | | | | | **All variables** | |
|---|---|---|---|---|---|---|---|---|
| | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** |
| (ln) GDPpc° | -0.4515 | -0.4504 | -0.4002 | -0.4081 | -0.4077 | -0.3539 | -0.3615 | |
| | (-9.59)*** | (-6.26)*** | (-6.09)*** | (-6.15)*** | (-5.05)*** | (-4.93)*** | (-4.34)*** | |
| (ln) Population° | 0.1000 | 0.1002 | 0.1212 | 0.1390 | 0.1394 | 0.1062 | 0.1248 | 0.1917 |
| | (2.70)** | (2.60)** | (3.10)** | (3.14)** | (3.06)** | (2.74)** | (2.72)** | (4.32)*** |
| (ln) Exports° | 0.2156 | 0.2159 | 0.2231 | 0.2117 | 0.2129 | 0.2265 | 0.2297 | 0.1852 |
| | (11.26)*** | (9.06)*** | (9.32)*** | (7.96)*** | (8.00)*** | (9.29)*** | (8.49)*** | (7.12)*** |
| Democracy° | 0.0234 | 0.0235 | 0.0225 | 0.0112 | 0.0107 | 0.0236 | 0.0129 | 0.0124 |
| | (4.92)*** | (3.18)** | (3.08)** | (1.32) | (1.24) | (3.22)** | (1.52) | (1.46) |
| (ln) Colonial history | 0.0641 | 0.0631 | 0.0307 | 0.0718 | 0.0730 | 0.0089 | 0.0469 | 0.0390 |
| | (2.12)* | (1.77) | (0.89) | (1.99)* | (1.80) | (0.25) | (1.11) | (0.91) |
| (ln) Distance | 0.6279 | 0.6284 | 0.6114 | 0.5902 | 0.5911 | 0.6681 | 0.6179 | 0.6494 |
| | (6.29)*** | (6.00)*** | (5.81)*** | (4.63)*** | (4.65)*** | (6.32)*** | (4.91)*** | (5.03)*** |
| Under-five mortality° | | 0.0001 | | | -0.0008 | | -0.0038 | -0.0029 |
| | | (0.05) | | | (-0.45) | | (-1.84) | (-1.44) |
| Maternal mortality° | | | 0.0473 | | 0.0128 | | -0.0040 | 0.0106 |
| | | | (2.65)** | | (0.54) | | (-0.16) | (0.43) |
| HIV prevalence° | | | | 0.0337 | 0.0318 | | 0.0320 | 0.0220 |
| | | | | (3.44)*** | (3.04)** | | (3.10)** | (2.13)* |
| HDI° | | | | | | -0.0158 | -0.0207 | -0.0255 |
| | | | | | | (-3.59)*** | (-3.41)*** | (-4.28)*** |
| Observations | 9,720 | 9,720 | 9,720 | 7,412 | 7,412 | 9,287 | 7,308 | 7,308 |
| No. of groups | 1,186 | 1,186 | 1,186 | 921 | 921 | 1,167 | 910 | 910 |
| R-squared overall model | 0.1593 | 0.1595 | 0.1612 | 0.1560 | 0.1548 | 0.1669 | 0.1663 | 0.1403 |
| Chi-squared | 536.4014 | 420.0252 | 424.7478 | 332.8533 | 334.3682 | 436.4538 | 349.1713 | 305.4131 |
| Rho | 0.5749 | 0.5743 | 0.5751 | 0.5912 | 0.5902 | 0.5839 | 0.5879 | 0.5928 |

Dependent variable is logged aid. OLS estimates of lognormal hurdle model. Robust standard errors clustered at country-pair level. All equations include year-specific time dummies. Coefficient of constant not reported. t-statistics are reported below the coefficient estimates. ° denotes a one-year lag. ***, **, and * denote significance at 0.1, 1, and 5 percent, respectively. Note also that the sample varies between columns because of data availability for some variables.

In column (6) we control for the general development level of a recipient country instead of specific health indicators. The coefficient for the HDI suggests a significantly negative impact on aid allocations: a one unit decrease in human development is associated with a 1.6% increase in health aid. The average donor allocates more aid to less developed countries.

In column (7) all variables have been controlled for, while in column (8) per capita income was omitted. Population size, exports, distance and HIV prevalence have a significantly positive impact on health assistance allocated by the average donor. Per capita income and HDI have a significantly negative impact on health aid on average.[116]

[116] We also included the Gini index as measurement of the social inequality in recipient countries. Due to data availability of the Gini index, many observations were dropped such that the coefficients seemed not to be reliable estimates.

Table 17 presents the estimation results for hypotheses two and three. In column (2) we added rights and liberties. The proxy for the general freedom in the recipient country has no significant impact on allocation decisions. In column (3) economic freedom was controlled for. The level of economic freedom has a significantly positive impact on health aid. Government effectiveness, included in column (4), has no significant effect. The perceived level of corruption, controlled for in column (5), has a significantly negative effect. In column (6) we controlled for all variables that approximate the institutional environment in the recipient country.

Table 17. Estimation results for institutional and recipient effort indicators, allocation decision by average donor

| | **Base** | **Hypothesis B.2** | | | | | | **Hypothesis B.3** | |
|---|---|---|---|---|---|---|---|---|---|
| | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** | **(9)** |
| (ln) GDPpc° | -0.4515 | -0.4484 | -0.6514 | -0.497 | -0.5792 | -0.6686 | -0.6706 | -0.4592 | -0.4758 |
| | (-7.39)*** | (-7.35)*** | (-8.83)*** | (-7.57)*** | (-8.24)*** | (-7.48)*** | (-7.51)*** | (-7.23)*** | (-7.58)*** |
| (ln) Population° | 0.1000 | 0.0977 | 0.0336 | 0.0587 | -0.0630 | -0.1305 | -0.1286 | 0.0875 | 0.0881 |
| | (2.65)** | (2.59)** | (0.74) | (1.43) | (-1.33) | (-2.52)* | (-2.47)* | (2.12)* | (2.13)* |
| (ln) Exports° | 0.2156 | 0.2161 | 0.2451 | 0.2393 | 0.3023 | 0.3110 | 0.3117 | 0.2292 | 0.2278 |
| | (9.07)*** | (9.10)*** | (8.42)*** | (9.28)*** | (9.95)*** | (9.29)*** | (9.32)*** | (8.99)*** | (8.92)*** |
| (ln) Democracy° | 0.0234 | 0.0228 | 0.0173 | 0.0157 | 0.0170 | | 0.0053 | 0.0100 | 0.0101 |
| | (3.19)** | (3.10)** | (2.05)* | (1.93) | (1.86) | | (0.54) | (1.24) | (1.26) |
| (ln) Colonial history | 0.0641 | 0.0639 | 0.0542 | 0.0575 | 0.0752 | 0.0450 | 0.0440 | 0.0743 | |
| | (2.00)* | (2.00)* | (1.34) | (1.68) | (1.99)* | (1.00) | (0.97) | (2.12)* | |
| (ln) Distance | 0.6279 | 0.6300 | 0.5481 | 0.7506 | 0.8112 | 0.8155 | 0.8118 | 0.7886 | 0.8405 |
| | (5.99)*** | (6.02)*** | (4.66)*** | (6.85)*** | (6.92)*** | (6.33)*** | (6.29)*** | (6.13)*** | (6.66)*** |
| Rights and liberties° | | -0.0143 | | | | -0.0449 | -0.0441 | | |
| | | (-1.02) | | | | (-2.07)* | (-2.03)* | | |
| Economic freedom° | | | 0.1684 | | | 0.2509 | 0.2426 | | |
| | | | (2.78)** | | | (2.71)** | (2.56)* | | |
| Government effectiveness° | | | | 0.0325 | | -0.2905 | -0.2883 | | |
| | | | | (0.33) | | (-1.92) | (-1.91) | | |
| CPI° | | | | | -0.0259 | -0.0355 | -0.0355 | | |
| | | | | | (-2.05)* | (-2.61)** | (-2.61)** | | |
| Public health expenditures° | | | | | | | | 0.0047 | -0.0028 |
| | | | | | | | | (0.10) | (-0.06) |
| Immunization rates° | | | | | | | | 0.0020 | 0.0016 |
| | | | | | | | | (1.15) | (0.90) |
| Observations | 9,720 | 9,720 | 7,218 | 6,966 | 4,962 | 4,034 | 4,034 | 7,320 | 7,320 |
| No. of groups | 1,186 | 1,186 | 923 | 1,152 | 1,027 | 853 | 853 | 1,090 | 1,090 |
| R-squared overall model | 0.1593 | 0.1597 | 0.1691 | 0.1689 | 0.1885 | 0.2017 | 0.2017 | 0.1628 | 0.1635 |
| Chi-squared | 419.7562 | 421.0941 | 350.4164 | 389.8956 | 364.0349 | 317.1649 | 319.4716 | 371.8798 | 363.1679 |
| Rho | 0.5749 | 0.5749 | 0.6028 | 0.6408 | 0.6596 | 0.6833 | 0.6831 | 0.6376 | 0.6386 |

Dependent variable is logged aid. OLS estimates of lognormal hurdle model. Robust standard errors clustered at country-pair level. All equations include year-specific time dummies. Coefficient of constant not reported. t-statistics are reported below the coefficient estimates. ° denotes a one-year lag. ***, **, and * denote significance at 0.1, 1, and 5 percent, respectively. Note also that the sample varies between columns because of data availability for some variables.

In column (7) we added the democracy variable; the results remain largely the same. The general level of freedom, expressed in rights and liberties, has a significantly negative impact on aid allocation: a one unit increase in freedom is associated with around about 4.5% less health aid. Economic freedom in a recipient country has a significantly positive impact on health aid on average: a one unit increase is associated with around about 25% more aid. Government effectiveness has no significant impact on the average allocation decision; the coefficient is negative. The perceived level of corruption has a significantly negative impact on health assistance: the average donor allocates 3.6% less aid to more corrupt countries. When controlling for the perceived corruption level, the coefficient on population size switches signs, suggesting that smaller countries and more corrupt countries receive more aid. The

importance of the colonial history vanishes if the institutional environment is controlled for. This suggests that the circumstances of a recipient country today are more important than historic ties between donor and recipient, at least for the average hypothetical donor.

In column (8) we add public health expenditures and immunization rates of the recipient country. In column (9) colonial history was omitted. In both cases, the coefficients for both variables are insignificant and smaller than 1%. These results suggest that donors do not consider recipients' efforts with respect to the national health system in their decisions on health aid. Thus, hypothesis three is rejected.

Table 18 provides the estimation results for hypothesis 4. In column (2) the interaction between US aid and the respective budget size of other donors is controlled for.[117] The results show that, on average, the allocation decisions by the United States have a different impact on the health aid provision by other donors depending on their size: a one percent increase in US aid has no significant impact on allocation decisions by small donors, while it is associated with a 0.1% increase in bilateral aid by big donors. In other words, despite the statistical significance of the US aid allocations, the economic significance for health aid is only marginal.

In column (3) lagged aid is added as independent variable. On average, previous aid allocations have a significantly positive effect on subsequent allocation decisions: one percent higher allocations are associated with a 0.8% increase in the following year. In column (4) the interaction term and lagged aid are included. The results suggest that US aid allocation decisions have a significantly positive influence on decisions taken by big donors. However, when lagged aid is controlled for, the effect is only marginal with 0.04% more on average.

Column (5) controls for allocation decisions of multilateral donors interacted with the relative donor importance. On average, multilateral aid has no significant effect on provision decisions by small donors. With respect to big donors, a one percent increase in multilateral aid is associated with a 0.09% increase in bilateral aid. Despite the statistical significance, the economic significance of multilateral aid for bilateral donors is only marginal. In column (6) the interaction term on multilateral aid and lagged aid are included. Here, the economic significance of multilateral aid decisions for allocation by big donors reduces to 0.05%.

[117] All constitutive terms should be included in multiplicative interaction models; e.g. $Y = \beta_o + \beta_1 X + \beta_2 Z + \beta_3 XZ + \varepsilon$. There is an alternative way of specifying interaction models when the modifying variable Z is discrete: $Y = \gamma_o + \gamma_1 Z + \gamma_2 XZ + \gamma_3 (X \neg Z) + \varepsilon$. In other words, it is only necessary to include *Z* as a separate variable when the included interaction terms are *XZ* and *X*¬*Z*. (Brambor et al. (2006), 66, 69)
Therefore, we included donor size as discrete modifying variable *Z* separately and the interactions between US aid and small donor (*XZ*), respectively US aid and big donor (*X*¬*Z*).

Table 18. Estimation results for rivalry indicators, allocation decision by average donor

| | **Base** | **Hypothesis B.4** | | | | |
|---|---|---|---|---|---|---|
| | | **B.4.1** | | | **B.4.2** | |
| | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** |
| (ln) GDPpc° | -0.4515 | -0.4116 | -0.2090 | -0.1811 | -0.3329 | -0.1913 |
| | (-7.39)*** | (-6.23)*** | (-8.68)*** | (-5.78)*** | (-5.50)*** | (-6.93)*** |
| (ln) Population° | 0.1000 | 0.1310 | -0.0408 | -0.0168 | 0.1331 | -0.0216 |
| | (2.65)** | (2.70)** | (-3.06)** | (-0.79) | (3.36)*** | (-1.13) |
| (ln) Exports° | 0.2156 | 0.1361 | 0.1064 | 0.0728 | 0.1629 | 0.0900 |
| | (9.07)*** | (4.94)*** | (9.29)*** | (4.83)*** | (6.67)*** | (6.64)*** |
| (ln) Democracy° | 0.0234 | 0.0207 | 0.0079 | 0.0042 | 0.0242 | 0.0081 |
| | (3.19)** | (2.49)* | (2.72)** | (1.08) | (3.22)** | (2.46)* |
| (ln) Colonial history | 0.0641 | 0.1216 | 0.0005 | 0.0247 | 0.0715 | -0.0030 |
| | (2.00)* | (3.33)*** | (0.04) | (1.51) | (2.18)* | (-0.22) |
| (ln) Distance | 0.6279 | 0.3942 | 0.2581 | 0.2240 | 0.6092 | 0.2608 |
| | (5.99)*** | (3.08)** | (6.54)*** | (3.74)*** | (5.72)*** | (5.37)*** |
| Donor size°$^{\mu}$ | | -0.1828 | | -0.1510 | | |
| | | (-0.40) | | (-0.50) | | |
| Small donor*(ln) US aid°$^{\mu}$ | | 0.0330 | | 0.0130 | | |
| | | (1.33) | | (0.94) | | |
| Big donor*(ln) US aid°$^{\mu}$ | | 0.0964 | | 0.0396 | | |
| | | (3.43)*** | | (2.40)* | | |
| (ln) Aid° | | | 0.7636 | 0.6804 | | 0.6933 |
| | | | (58.59)*** | (40.75)*** | | (44.95)*** |
| Donor size° | | | | | -0.1981 | -0.3211 |
| | | | | | (-0.48) | (-1.30) |
| Small donor*(ln) Multilateral aid° | | | | | 0.0250 | 0.0138 |
| | | | | | (1.10) | (0.88) |
| Big donor*(ln) Multilateral aid° | | | | | 0.0901 | 0.0528 |
| | | | | | (3.78)*** | (3.46)*** |
| Observations | 9,720 | 6,415 | 7,843 | 5,352 | 8,455 | 7,103 |
| No. of groups | 1,186 | 938 | 1,030 | 816 | 1,144 | 991 |
| R-squared overall model | 0.1593 | 0.1601 | 0.6673 | 0.6076 | 0.2156 | 0.6667 |
| Chi-squared | 419.7562 | 430.6662 | 7120.9168 | 4002.4360 | 553.2306 | 5662.7516 |
| Rho | 0.5749 | 0.5695 | 0.0375 | 0.0732 | 0.6031 | 0.0947 |

Dependent variable is logged aid. OLS estimates of lognormal hurdle model. Robust standard errors clustered at country-pair level. All equations include year-specific time dummies. Coefficient of constant not reported. t-statistics are reported below the coefficient estimates. ° denotes a one-year lag. μ denotes that the donor USA is excluded. ***, **, and * denote significance at 0.1, 1, and 5 percent, respectively. Note also that the sample varies between columns because of data availability for some variables.

When lagged aid is included, we observe a noteworthy increase in the R-squared of the overall model, which is four times higher than the base estimation. This is a strong argument to always include lagged aid as explanatory variable since this variable apparently has remarkable explanatory power. As has been argued before, aid decisions are related to previously taken decisions. On the other hand, the inclusion of the lagged dependent variable on the right hand side lowers the relative importance of the standard control variables and other independent variables considerably, as is visible in the comparison of columns (1) and (3). The drawback is that the lagged dependent variable does not

contribute much to our understanding which factors have driven the decision initially, except for acknowledging that each year's decisions are not independent.[118]

The hypotheses that US aid and multilateral aid affect the decision-making process of bilateral donors have been confirmed, but with limitations. We could not find any evidence for completely opposing effects for small and big donors. Both US aid and multilateral aid decisions are statistically insignificant for the allocation decisions of small donors. We could find a statistical significantly positive effect for the decisions taken by big bilateral donors, suggesting that other large donors complement the allocation pattern of the United States, as well as that all donors complement the multilateral allocations. Yet, the economic significance is only marginal in both cases.

Table 19 reports the estimation results for hypothesis five on the programmatic preferences of the donor. In column (2) expenditures for health in the donor country were added. They have a significantly positive effect on health aid: on average, a one unit increase is associated with a 22% increase in allocated aid.[119] In column (3) political transparency in the donor country is controlled for. The coefficient is insignificant but negative as expected. In column (4) social inequality and per capita income in the donor country are added. Social inequality has a significantly positive effect on health assistance, contrary to what one would expect. A one unit increase on the Gini index corresponds to an almost 5% increase in aid allocation. Per capita income has a significantly positive effect too: a one percent increase is associated with a 1.4% increase in provided health assistance.

In column (5) all variables are controlled for. The coefficient of health expenditures is no longer significant but remains positive. Political transparency, social inequality and donors' per capita income have a significant effect on aid allocation decisions. Since the variable health expenditures causes the number of observations to be remarkably lower, in column (6) we control for all other variables. More corrupt donor countries provide, on average, 5% less health assistance; however, the coefficient is statistically insignificant. Thus, the available evidence for the importance of political transparency is inconsistent. Other than expected, donor countries with greater social inequality provide almost 6% more aid. In addition, donor countries with greater per capita income provide 1.2% more health aid on average.

[118] Since our primary interest is to understand which factors determine the allocation decisions for health assistance, it seems reasonable to not include the lagged aid variable as independent variable in the other specifications.

[119] As commented below, the robustness of this result is questionable because the number of observations drops dramatically because data on health expenditures in the donor country are only available for the years 2003 till 2007.

Table 19. Estimation results for indicators of programmatic preferences, allocation decision by average donor

| | Base | Hypothesis B.5 | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| (ln) GDPpc° | -0.4515 | -0.5048 | -0.4728 | -0.5227 | -0.5576 | -0.5276 |
| | (-7.39)*** | (-6.21)*** | (-7.98)*** | (-8.93)*** | (-6.45)*** | (-8.93)*** |
| (ln) Population° | 0.1000 | 0.0351 | 0.0762 | 0.0592 | 0.0526 | 0.0541 |
| | (2.65)** | (0.60) | (1.90) | (1.57) | (0.83) | (1.33) |
| (ln) Exports° | 0.2156 | 0.1944 | 0.2285 | 0.2565 | 0.1948 | 0.2552 |
| | (9.07)*** | (4.90)*** | (9.07)*** | (11.12)*** | (4.31)*** | (10.16)*** |
| (ln) Democracy° | 0.0234 | 0.0192 | 0.0130 | 0.0250 | 0.0187 | 0.0155 |
| | (3.19)** | (1.76) | (1.61) | (3.46)*** | (1.56) | (1.88) |
| (ln) Colonial history | 0.0641 | 0.0780 | 0.0479 | 0.0747 | 0.0455 | 0.0576 |
| | (2.00)* | (1.79) | (1.40) | (2.43)* | (0.93) | (1.73) |
| (ln) Distance | 0.6279 | 0.5751 | 0.7913 | 0.4438 | 0.6113 | 0.5920 |
| | (5.99)*** | (3.78)*** | (6.95)*** | (4.36)*** | (3.64)*** | (5.37)*** |
| Expenditures for health, donor° | | 0.2225 | | | 0.0913 | |
| | | (5.23)*** | | | (1.75) | |
| Political transparency, donor° | | | -0.0700 | | -0.6590 | -0.0457 |
| | | | (-1.91) | | (-6.54)*** | (-1.16) |
| Social inequality, donor° | | | | 0.0467 | 0.0264 | 0.0556 |
| | | | | (5.71)*** | (2.13)* | (6.31)*** |
| (ln) GDPpc, donor° | | | | 1.3766 | 1.6406 | 1.1688 |
| | | | | (7.75)*** | (5.94)*** | (6.23)*** |
| Observations | 9,720 | 2,389 | 7,595 | 8,338 | 1,798 | 6,533 |
| No. of groups | 1,186 | 803 | 1,160 | 1,148 | 667 | 1,095 |
| R-squared overall model | 0.1593 | 0.1949 | 0.1552 | 0.2283 | 0.1970 | 0.2214 |
| Chi-squared | 419.7562 | 237.0334 | 394.6846 | 556.0133 | 358.9945 | 490.9489 |
| Rho | 0.5749 | 0.7489 | 0.6320 | 0.5496 | 0.7110 | 0.6028 |

Dependent variable is logged aid. OLS estimates of lognormal hurdle model. Robust standard errors clustered at country-pair level. All equations include year-specific time dummies. Coefficient of constant not reported. t-statistics are reported below the coefficient estimates. ° denotes a one-year lag. ***, **, and * denote significance at 0.1, 1, and 5 percent, respectively. Note also that the sample varies between columns because of data availability for some variables.

The results for the hypothesis that a donor's preference for health on the national political agenda is reflected in the allocation decision for health assistance are mixed. On the one hand, donor countries with greater health expenditures provide more aid, but, on the other hand, the result is not consistently significant. The same is true for the effect of corruption in the donor country, which, on the one hand, lowers the provision of health assistance, but, on the other hand, is not consistently significant. The effect of own preferences respectively political transparency is ambiguous because the number of observations in the regressions including these variables drops dramatically due to data availability and, therefore, valid conclusions seem to be difficult. Contrary to common expectations, more unequal societies provide consistently more assistance. As expected, richer donor countries provide consistently greater aid shares.

Table 20 provides the estimation results for the hypotheses on relational ties between donors and recipients. Column (2) tests for the importance of imports by the recipient but finds no significant relationship. In column (3) trade is substituted for exports. Trade links have a similar significantly positive effect on aid allocation as export links: a one percent increase in either leads to a 0.2%

increase in allocated aid. Columns (4) and (5) add the political integration of the recipient and the political proximity between donor and recipient. Contrary to our expectations, political links have no statistical significance, regardless if colonial history is excluded.[120] In columns (6) and (7) the importance of cultural links is tested for. The results suggest that, if donor and recipient have the same dominant language, the allocation of health aid is increased by almost 80%. Colonial history seems to capture the cultural link between donor and recipient visible in the same language. The inclusion of dominant language renders colonial history insignificant but the variable own colony remains significant. The same dominant religion has a similar significantly positive effect of almost 25% more aid. The coefficient of cultural integration is significant but negative, suggesting that culturally integrated recipients receive less aid. However, the economic significance is relatively small with -2%, compared to the other explanatory variables.

Column (8) tests for the importance of a common colonial experience versus a colonial link between another donor and the recipient. The coefficient of own colony suggests that a longer common colonial history increases aid allocation by 0.4%. The coefficient of other colony is insignificant. The particular link between donor and recipient, in form of the common past, increases aid but the existence of such link between another donor and the recipient does not have a negative effect as expected.

In column (9) distance is replaced by continent dummies for America, Asia, Europe and Oceania. Africa is the base level, in order to control for the geographic location of recipients. The dummy variables for Asia and Europe have a significant effect on the provision of health assistance: an Asian country receives 30% less aid respectively, a European country receives 70% less aid than an African country. The other dummy variables are insignificant. In column (10) all variables that were previously significant are controlled for. When other relational ties are included, the geographic location becomes insignificant. The other findings remain largely the same as in the separate analysis.

Relational ties between donor and recipient are an important factor for aid allocation decisions, but their relative importance varies. The available evidence for economic, cultural and historic links is consistent, while political links seem to be insignificant for health assistance and the results for geographic ties are inconsistent. Overall, the hypothesis that the relationships between donor and recipient largely explain allocations of health assistance could be confirmed. This is particularly the case for economic, cultural and historic ties.

[120] The variable *diplomatic exchange* was included in previous estimations in order to control for the effect of high level diplomatic relations between donor and recipient. According to the expectation that bigger amounts of aid flow to recipients with whom diplomatic relations are maintained, a statistical significantly positive effect of 60% more aid could be found. However, since the number of observations dropped dramatically due to data availability, the result was not as trustworthy and robust as the others, and hence was not included.

Table 20. Estimation results for relationship indicators, allocation decision by average donor

| | | Hypothesis B.6 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Base | Economic | | Political | | Cultural | | Historic | Geographic | All variables |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| (ln) GDPpc° | -0.4515 | -0.4808 | -0.4482 | -0.4687 | -0.4859 | -0.3063 | -0.3068 | -0.4328 | -0.4383 | -0.3053 |
| | (-7.39)*** | (-7.50)*** | (-7.04)*** | (-7.20)*** | (-7.68)*** | (-4.31)*** | (-4.31)*** | (-7.14)*** | (-6.83)*** | (-4.12)*** |
| (ln) Population° | 0.1000 | 0.0647 | 0.1093 | 0.0940 | 0.0953 | 0.1287 | 0.1286 | 0.1277 | 0.1734 | 0.1939 |
| | (2.65)** | (1.60) | (2.72)** | (1.99)* | (2.01)* | (3.28)** | (3.28)** | (3.39)*** | (4.22)*** | (4.52)*** |
| (ln) Exports° | 0.2156 | 0.2148 | | 0.2194 | 0.2189 | 0.2227 | 0.2227 | 0.1926 | 0.1925 | |
| | (9.07)*** | (8.12)*** | | (8.90)*** | (8.87)*** | (9.38)*** | (9.38)*** | (7.93)*** | (8.25)*** | |
| Democracy° | 0.0234 | 0.0241 | 0.0229 | 0.0223 | 0.0217 | 0.0207 | 0.0206 | 0.0233 | 0.0243 | 0.0204 |
| | (3.19)** | (3.22)** | (3.09)** | (2.86)** | (2.80)** | (2.81)** | (2.81)** | (3.18)** | (3.19)** | (2.68)** |
| (ln) Colonial history | 0.0641 | 0.0735 | 0.0624 | 0.0638 | | 0.0070 | | | 0.0810 | |
| | (2.00)* | (2.26)* | (1.93) | (1.80) | | (0.21) | | | (2.22)* | |
| (ln) Distance | 0.6279 | 0.6361 | 0.5623 | 0.6811 | 0.7461 | 0.5238 | 0.5296 | 0.6297 | | |
| | (5.99)*** | (6.07)*** | (5.36)*** | (6.08)*** | (7.16)*** | (4.91)*** | (5.11)*** | (5.95)*** | | |
| (ln) Imports° | | 0.0257 | | | | | | | | |
| | | (1.29) | | | | | | | | |
| (ln) Trade° | | | 0.1966 | | | | | | | 0.1679 |
| | | | (7.70)*** | | | | | | | (6.46)*** |
| Political integration° | | | | 0.0027 | 0.0033 | | | | | |
| | | | | (0.83) | (1.03) | | | | | |
| Political proximity° | | | | 0.0202 | 0.0206 | | | | | |
| | | | | (0.30) | (0.31) | | | | | |
| Dominant language | | | | | | 0.7704 | 0.7760 | | | 0.6734 |
| | | | | | | (5.50)*** | (5.61)*** | | | (4.43)*** |
| Dominant religion | | | | | | 0.2318 | 0.2302 | | | 0.2767 |
| | | | | | | (2.07)* | (2.05)* | | | (2.23)* |
| Cultural integration° | | | | | | -0.0210 | -0.0212 | | | -0.0196 |
| | | | | | | (-3.56)*** | (-3.72)*** | | | (-3.20)** |
| (ln) Own Colony | | | | | | | | 0.4227 | | 0.3283 |
| | | | | | | | | (8.22)*** | | (6.45)*** |
| (ln) Other Colony | | | | | | | | 0.0307 | | |
| | | | | | | | | (0.94) | | |
| America | | | | | | | | | 0.5588 | 0.6037 |
| | | | | | | | | | (1.57) | (1.71) |
| Asia | | | | | | | | | -0.2922 | -0.0375 |
| | | | | | | | | | (-1.99)* | (-0.25) |
| Europe | | | | | | | | | -0.7004 | -0.3205 |
| | | | | | | | | | (-2.47)* | (-1.14) |
| Oceania | | | | | | | | | 0.0141 | -0.3996 |
| | | | | | | | | | (0.04) | (-0.97) |
| Observations | 9,720 | 9,366 | 9,716 | 9,078 | 9,078 | 9,720 | 9,720 | 9,720 | 9,720 | 9,716 |
| No. of groups | 1,186 | 1,155 | 1,186 | 1,106 | 1,106 | 1,186 | 1,186 | 1,186 | 1,186 | 1,186 |
| R-squared overall mod | 0.1593 | 0.1635 | 0.1457 | 0.1695 | 0.1721 | 0.1731 | 0.1733 | 0.1602 | 0.1373 | 0.1480 |
| Chi-squared | 419.7562 | 423.5592 | 392.3242 | 412.8226 | 401.0756 | 480.1644 | 478.9201 | 550.4539 | 384.1648 | 530.5032 |
| Rho | 0.5749 | 0.5766 | 0.5813 | 0.5767 | 0.5773 | 0.5669 | 0.5668 | 0.5711 | 0.5823 | 0.5741 |

Dependent variable is logged aid. OLS estimates of lognormal hurdle model. Robust standard errors clustered at country-pair level. All equations include year-specific time dummies. Coefficient of constant not reported. t-statistics are reported below the coefficient estimates. ° denotes a one-year lag. ***, **, and * denote significance at 0.1, 1, and 5 percent, respectively. Note also that the sample varies between columns because of data availability for some variables.

### 8.2.3. Sensitivity analysis

We employed several robustness tests in order to check if the results are sensitive to any changes in the specification. First, we used a time lag of two years. The significance levels are in some instances lower than before. Consequently, some proxies for institutional quality, the interaction between big donor and US aid, and the CPI are insignificant. Nevertheless, the coefficients remain largely unaffected.

Second, a more homogeneous subsample of recipients was analyzed by dropping transition countries in order to, at least tentatively, assess whether the diversity of countries affects the results. The results for the base estimation change slightly. The coefficient on population size becomes negative but insignificant. The other coefficients remain largely unchanged, although democracy and colonial history are insignificant. All health indicators have a significant effect on allocation decisions. The coefficient on maternal mortality suggests that higher rates lead to a decrease of up to 1%. The prevalence of HIV has a consistently positive effect on aid allocations ranging between 3% and 6%. Aid is consistently allocated to less developed countries which receive between 4% and 5% more aid. Rights and liberties have a consistently negative effect on aid allocations suggesting that less free countries receive more aid. More economic freedom is associated with approximately 25% more aid. The government effectiveness and democracy level are insignificant. Higher perceived corruption decreases aid allocations by 3%-4%. The results for hypothesis three remain unchanged. The results for the interaction between donor size and US aid suggest a greater complementary impact for both small and big donors; however, the effect is inconsistent. Multilateral aid has a consistent complementary effect on aid provision by big donors. Expenditures for healthcare by the donor have a significantly positive impact on aid allocations; yet, the number of observations is considerably lower. The political transparency has a negative, but not consistently significant effect on aid provision. More unequal societies and richer donor countries provide more aid on average. The results remain unchanged in terms of relational ties, except that the relative importance of economic and cultural links increases.

Third, we were able to assess the possible determinants of health assistance for another homogenous subsample of recipients by excluding upper-middle income countries. With respect to the base estimation, the coefficient on population size becomes negative but insignificant. The coefficient on colonial history remains unchanged but becomes insignificant. The results for hypotheses three and five remain unchanged. Under-five mortality and HIV prevalence have a positive impact on aid allocation. Maternal mortality has a negative effect on health aid. The only health indicator with a consistent effect across all specifications is HIV prevalence which corresponds to 3% to 5% more aid. Less developed countries receive between 3% and 5% less aid. Greater rights and liberties have a consistently significant negative impact of up to 6% on health assistance. The effect of economic freedom is consistently positive with approximately 25% more allocated aid. Government effectiveness and higher corruption reduces the health aid provision but not consistently. US aid

allocation increases aid provision by large donors but less consistently. The effect of multilateral aid on allocation by bilateral donors remains the same. By and large, the results for relational ties are unaffected. The importance of cultural links is greater than in the original estimations. A recipient on the American continent is more likely to be selected than an African country, while Asian and European countries are less likely to be selected.

Fourth, we analyzed whether the donor diversity affected the results. Since the United States and Canada account for almost fifteen percent of all allocation decisions in the sample, we re-estimated the hypotheses excluding them. When North American donors are excluded, the coefficients on population and democracy are insignificant. The significantly positive effect of exports, colonial history and distance increases. While under-five mortality has a significantly positive effect, maternal mortality has a significantly negative impact. The only health indicator that is consistently significant is prevalence of HIV which corresponds to an increase in aid between 5% and 8%. Less developed countries receive between 3% and 4% more health assistance. As regards the institutional quality in the recipient country, the only factor that has a consistently positive effect on aid allocations is economic freedom. The results for hypothesis three remain unchanged. The results for the interaction between donor size and US aid suggest a greater complementary impact for both small and big donors; however, the effect is inconsistent. Multilateral aid has a consistent complementary effect on aid provision by big donors. Expenditures for health by the donor country have a consistently negative impact between 28% and 40% on aid allocation. The results for political transparency are as inconsistent as before. Socially unequal donor countries provide less aid, but inconsistently. Richer donor countries provide more aid on average. The results for the relationship between donor and recipient are largely the same as before. The importance of cultural links is greater. The common colonial experience has a significantly positive impact on aid allocation, regardless whether the recipient was an own colony or the colony of another donor. The fact that some of the general findings change when the North American donors are excluded suggests to test the hypotheses with disaggregate data. Such individual analysis would enable a more fine-grained picture of bilateral allocation decisions.

Fifth, we were not able to estimate all hypotheses with other similar variables. However, with respect to indicators of institutional quality, we were able to exchange some, in order to check how sensible the results are to the specific variables used. The *Index of Economic Freedom* (IEF) replaced economic freedom. The overall economic freedom score for each economy is constructed by ten components measuring an aspect of economic freedom on a scale from 0 to 100, equally weighted and averaged (Miller et al. (2011): 447). One of the Worldwide Governance Indicators, control of corruption, replaced the Corruption Perception Index. *Corruption* captures perceptions of the extent to which public power is exercised for private gain (Kaufmann et al. (2010): 4). The variable was re-coded such that it ranges from -2.5 to 2.5, with higher values corresponding to more corruption. The results for hypothesis two changed considerably, because economic freedom and corruption no longer

have a significant effect on aid allocation. We also replaced the CPI as proxy for political transparency by the above inverted corruption variable as alternative proxy. Contrary to expectations, greater political transparency has a significantly negative impact on aid allocations, yet inconsistently.

The main question focuses on the orientation of donors at recipient need, as evidenced by poor health indicators. Africa is often portrayed as the miserable continent, where people suffer from hardship like poverty and illnesses: "Africa's AIDS crisis is leaving a generation of undereducated, undernourished, underparented orphans who will soon be adults" (Easterly (2007), 249). It has been argued that the epidemic may complicate the development process in some African countries because of the high direct and indirect costs for an economy, in addition to the individual tragedy related to a premature death caused by HIV/Aids (Folland et al. (2007), 545-546). It seems reasonable that global health problems in specific and poverty in general determine the flows of development assistance to the African continent. Therefore, the first hypothesis was re-estimated, focusing on the African continent as an additional robustness test.

Table 21. Estimation results for need and development indicators (African continent), allocation decision by average donor

| | **Base** | **Hypothesis B.1** | | | | | **All variables** | |
|---|---|---|---|---|---|---|---|---|
| | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** |
| (ln) GDPpc° | -0.2097 | -0.2062 | -0.1824 | -0.1737 | -0.1821 | -0.0653 | -0.1019 | |
| | (-2.93)** | (-2.45)* | (-2.41)* | (-2.14)* | (-1.91) | (-0.76) | (-1.04) | |
| (ln) Population° | 0.3107 | 0.3102 | 0.3276 | 0.3570 | 0.3602 | 0.3113 | 0.3313 | 0.3531 |
| | (4.78)*** | (4.77)*** | (4.91)*** | (4.53)*** | (4.45)*** | (4.64)*** | (3.99)*** | (4.36)*** |
| (ln) Exports° | 0.1871 | 0.1880 | 0.1935 | 0.1626 | 0.1635 | 0.2061 | 0.1862 | 0.1794 |
| | (6.44)*** | (6.45)*** | (6.58)*** | (5.18)*** | (5.20)*** | (6.79)*** | (5.81)*** | (5.80)*** |
| Democracy° | 0.0164 | 0.0165 | 0.0158 | 0.0064 | 0.0060 | 0.0141 | 0.0081 | 0.0073 |
| | (1.71) | (1.72) | (1.67) | (0.59) | (0.55) | (1.55) | (0.76) | (0.68) |
| (ln) Colonial history | -0.0067 | -0.0081 | -0.0081 | 0.0106 | 0.0146 | -0.0549 | -0.0138 | -0.0186 |
| | (-0.12) | (-0.15) | (-0.15) | (0.18) | (0.24) | (-0.91) | (-0.21) | (-0.29) |
| (ln) Distance | 1.1235 | 1.1237 | 1.0994 | 1.0241 | 1.0264 | 1.1664 | 1.0574 | 1.0911 |
| | (6.57)*** | (6.56)*** | (6.32)*** | (4.85)*** | (4.90)*** | (6.66)*** | (5.06)*** | (5.28)*** |
| Under-five mortality° | | 0.0002 | | | -0.0007 | | -0.0036 | -0.0034 |
| | | (0.13) | | | (-0.34) | | (-1.51) | (-1.47) |
| Maternal mortality° | | | 0.0311 | | 0.0043 | | -0.0169 | -0.0129 |
| | | | (1.35) | | (0.16) | | (-0.61) | (-0.47) |
| HIV prevalence° | | | | 0.0166 | 0.0162 | | 0.0158 | 0.0124 |
| | | | | (1.40) | (1.35) | | (1.33) | (1.07) |
| HDI° | | | | | | -0.0245 | -0.0273 | -0.0291 |
| | | | | | | (-4.07)*** | (-3.77)*** | (-4.10)*** |
| Observations | 5,866 | 5,866 | 5,866 | 4,884 | 4,884 | 5,571 | 4,793 | 4,836 |
| No. of groups | 666 | 666 | 666 | 573 | 573 | 652 | 562 | 567 |
| R-squared overall model | 0.1737 | 0.1742 | 0.1745 | 0.1556 | 0.1543 | 0.1890 | 0.1696 | 0.1658 |
| Chi-squared | 258.2133 | 258.5684 | 258.8762 | 205.8844 | 208.5389 | 270.8549 | 220.5363 | 221.9502 |
| Rho | 0.5836 | 0.5819 | 0.5842 | 0.6097 | 0.6071 | 0.5964 | 0.6067 | 0.6062 |

Dependent variable is logged aid. OLS estimates of lognormal hurdle model. Robust standard errors clustered at country-pair level. All equations include year-specific time dummies. Coefficient of constant not reported. t-statistics are reported below the coefficient estimates. ° denotes a one-year lag. ***, **, and * denote significance at 0.1, 1, and 5 percent, respectively. Note also that the sample varies between columns because of data availability for some variables. Only observations for countries on the African continent were used.

The results, as shown in Table 21, are astonishing because the findings suggest that the average allocation decision concerning Africa is not determined by health indicators at all. Different from the

base estimation of the original sample, democracy and colonial history are insignificant. The other coefficients remain the same, although per capita income is apparently less relevant. Population size, exports and distance have a consistently positive effect, while the human development has a consistently negative impact.

The findings of Dollar and Levin (2006), and Isopi and Mavrotas (2009) suggest that donors have become more selective in recent years. Therefore, we restrict the time period covered by focusing on the last six years, i.e. 2002-2007, and rerun the regression for the first hypothesis as last sensitivity check. As shown in Table 22, the population size and the colonial past are insignificant regarding the results of the baseline estimation. This means, first, that the average donor does not consider the recipient's size and, second, that donors do not care about the colonial experience anymore, on average. Estimated in isolation, under-five mortality, maternal mortality and HIV prevalence have a significantly positive effect on the average allocation decision in recent years.

Table 22. Estimation results for need and development indicators (2002-2007), allocation decision by average donor

| | **Base** | **Hypothesis B.1** | | | | | **All variables** | |
|---|---|---|---|---|---|---|---|---|
| | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** |
| (ln) GDPpc° | -0.4434 | -0.3305 | -0.3877 | -0.5248 | -0.4698 | -0.2314 | -0.3986 | |
| | (-6.90)*** | (-4.28)*** | (-5.62)*** | (-7.20)*** | (-5.18)*** | (-2.76)** | (-3.99)*** | |
| (ln) Population° | 0.0041 | 0.0247 | 0.0296 | 0.0573 | 0.0466 | 0.0048 | 0.0232 | 0.0765 |
| | (0.09) | (0.54) | (0.63) | (1.12) | (0.87) | (0.10) | (0.43) | (1.47) |
| (ln) Exports° | 0.2482 | 0.2554 | 0.2535 | 0.2727 | 0.2804 | 0.2811 | 0.3046 | 0.2593 |
| | (8.97)*** | (9.15)*** | (9.14)*** | (8.68)*** | (8.87)*** | (9.83)*** | (9.36)*** | (8.70)*** |
| Democracy° | 0.0175 | 0.0184 | 0.0185 | 0.0079 | 0.0067 | 0.0189 | 0.0054 | 0.0032 |
| | (2.10)* | (2.20)* | (2.21)* | (0.84) | (0.71) | (2.23)* | (0.57) | (0.34) |
| (ln) Colonial history | 0.0484 | -0.0091 | 0.0156 | 0.0316 | -0.0087 | -0.0673 | -0.0508 | -0.0748 |
| | (1.29) | (-0.21) | (0.39) | (0.76) | (-0.19) | (-1.55) | (-1.02) | (-1.52) |
| (ln) Distance | 0.8709 | 0.8882 | 0.8437 | 0.7271 | 0.7610 | 0.9134 | 0.7935 | 0.8667 |
| | (7.36)*** | (7.46)*** | (7.09)*** | (5.17)*** | (5.38)*** | (7.74)*** | (5.65)*** | (6.13)*** |
| Under-five mortality° | | 0.0052 | | | 0.0079 | | 0.0040 | 0.0034 |
| | | (3.09)** | | | (3.39)*** | | (1.31) | (1.09) |
| Maternal mortality° | | | 0.0485 | | -0.0778 | | -0.0818 | -0.0684 |
| | | | (2.48)* | | (-2.66)** | | (-2.76)** | (-2.29)* |
| HIV prevalence° | | | | 0.0629 | 0.0730 | | 0.0687 | 0.0453 |
| | | | | (5.32)*** | (5.57)*** | | (5.25)*** | (3.69)*** |
| HDI° | | | | | | -0.0335 | -0.0251 | -0.0428 |
| | | | | | | (-5.41)*** | (-2.26)* | (-4.17)*** |
| Observations | 4,369 | 4,369 | 4,369 | 3,468 | 3,468 | 4,312 | 3,423 | 3,497 |
| No. of groups | 1,092 | 1,092 | 1,092 | 854 | 854 | 1,068 | 839 | 853 |
| R-squared overall model | 0.1772 | 0.1818 | 0.1794 | 0.1980 | 0.2045 | 0.2004 | 0.2193 | 0.1948 |
| Chi-squared | 313.0696 | 328.2020 | 325.9161 | 311.3941 | 328.4289 | 360.1968 | 342.7383 | 330.1328 |
| Rho | 0.7209 | 0.7199 | 0.7204 | 0.7194 | 0.7162 | 0.7142 | 0.7101 | 0.7177 |

Dependent variable is lnged aid. OLS estimates of lnnormal hurdle model. Robust standard errors clustered at country-pair level. All equations include year-specific time dummies. Coefficient of constant not reported. t-statistics are reported below the coefficient estimates. ° denotes a one-year lag. ***, **, and * denote significance at 0.1, 1, and 5 percent, respectively. Note also that the sample varies between columns because of data availability for some variables. Only observations for the years 2002-2007 were used.

When all health indicators are estimated together, the coefficients on under-five mortality and HIV prevalence remain the same, while the coefficient on maternal mortality becomes negative. This suggests that a higher maternal mortality rate decreases the allocation by the average donor,

controlling for under-five mortality and HIV prevalence. The under-five mortality has a significantly positive, but only small, effect on the average allocation decision. HIV prevalence has the most consistent significantly positive effect on the average allocation decision. It seems that funding focuses on HIV/Aids as global health problem; much less on under-five mortality and maternal mortality as correlated global health problems. The results even suggest that HIV/Aids crowds out funding for the reduction of maternal mortality.

It seems that the average donor based the provision of health aid a little more on recipient need visible in poor health indicators, low per capita income respectively low human development in recent years. Nevertheless, also economic links and the donor-recipient distance have a consistently positive impact.

### 8.2.4. Concluding remarks

In summary, the analysis of the allocation decision of the average donor shows that health indicators are less important for the allocation of health assistance by the average donor, than the policy statements of bilateral donors would suggest. More general indicators of development such as per capita income or the level of human development are at least as important. Some institutional indicators like economic freedom and perceived corruption are decisive factors for the average hypothetical donor, while the indicators used to approximate the recipient's efforts for the national health system are insignificant. Although the allocation decision of the average donor with a relatively large budget is affected by the allocation pattern of the US as largest donor respectively multilateral donors, the effect of strategic interactions is only marginal. The analysis shows that indicators on donors' programmatic preferences are important for allocation decisions. Economic, cultural and historic links between donor and recipient are decisive determinants for the allocation pattern of the average donor.

The *first hypothesis* poses the question how important health indicators are for the allocation decision of the average donor. On the one hand, the results show that the average donor considers health indicators when allocating health assistance. On the other hand, the estimations and the robustness tests identify HIV prevalence as the only health indicator with a consistently positive effect on the allocation decision for health assistance. The findings also reveal that the average donor is inclined to allocate more health assistance to poor recipients respectively less developed recipients. Focusing on the African continent, the average allocation decision is not determined by any health indicator. Restricting the time period on the last six years, the results show that the average donor is a little more oriented at recipient need visible in poor health indicators, low per capita income respectively low human development when allocating health assistance. Nevertheless, also economic links and the donor-recipient distance have a consistently positive effect on aid provision in recent years.

The *second hypothesis* focuses on the importance of the quality of the institutional environment in the recipient country for allocation decisions. Economic freedom increases the allocated health assistance, while rights and liberties, as measure of general freedom, lowers it. Government effectiveness has no significant effect on the allocation decision by the average donor, but the perceived corruption in the recipient country decreases the allocated health assistance. Since these findings are robust to various sensitivity analyses, the conclusion is that, on the one hand, the average bilateral donor allocates more health assistance to recipients with greater economic freedom, less rights and liberties, and less perceived corruption. The fact that recipients with less general freedom receive more health aid can be interpreted in two ways: The average donor either provides greater shares of health assistance in order to compensate for bad general conditions, which possibly imply poor health circumstances, or to 'buy' regimes. On the other hand, however, the role of rights and liberties is not as clear, since the coefficient is insignificant when estimated separately.

*Hypothesis three* analyzes the importance of national expenditures for public health by the recipient for the allocation decision of the average donor. The findings illustrate that these efforts by the national government of the receiving country are insignificant for the average allocation decision, regardless of the specification. On the one hand, this result implies that allocation of health assistance is simply independent from the activities for the national health system by the government of the recipient. On the other hand, the finding can also imply that the proxies for reflecting the efforts extended by the recipient are inadequate.

The *fourth hypothesis* focuses on the possible effect of strategic interactions among bilateral donors respectively between bilateral and multilateral donors for the allocation decision. According to our estimation results, the average donor with a relatively large aid budget is inclined to complement allocations by the US and by multilateral donors. Despite the statistical significance, however, the effect is not substantial. Strategic interactions have no significant effect on allocation decisions taken by the average bilateral donor with a relatively small aid budget. Our findings also reveal allocation decisions as path dependent. In summary, the importance of strategic interactions for the allocation decision of the average donor could only be partly confirmed.

*Hypothesis five* questions the importance of programmatic preferences of the donor for the allocation decision. The findings show that, on average, the preference of the donor for health on the national political agenda increases the provision of health assistance, while more corruption in the donor country decreases the aid allocation. Unfortunately, these results are ambiguous due to a dramatic drop in the number of observations between different specifications, which makes valid conclusions difficult. The other results show that, different to expectations, more unequal donor societies provide consistently more assistance, controlling for per capita income of donor countries. In summary, it seems important to control for donor characteristics to understand the average donor behavior in aid allocation.

*Hypothesis six* analyzes the importance of different bilateral ties between donor and recipient for the average allocation decision. According to the estimation results, economic, cultural and historic links are decisive determinants of the allocation decision by the average donor. Political and geographic proximity are insignificant for such decision; however, Asian and European countries receive less aid on average.

## 8.3. Selection and allocation decisions by individual donors

The following analysis examines the driving forces of the selection and aid allocation of major and like-minded donors. The major donors are France, Germany, Spain, the United Kingdom and the United States, while the like-minded donors are Canada, Denmark, the Netherlands, Norway and Sweden.[121] The principal question remains the effect of health indictors on the decision-making process for health aid. Since many other determinants are known to potentially influence the individual decision, the impact of the institutional quality and of the national health system in the recipient country, of competition among different donor types and the relationship between donor and recipient is controlled for.[122]

### 8.3.1. Estimation approach

A lognormal hurdle model has been used to estimate the selection and the allocation decisions. In the first step, the estimation of the *selection* equation involves the estimation of a binary response model. The dependent variable is the probability that a donor provides positive amounts of aid, the visible evidence for the recipient's selection. The basic equation of the *panel probit model* takes the following form:

$$Pr\left[DAH_{ijt} = 1 \middle| x_{ijt}\right] = Pr\left[DAH_{ijt}^{*} > 0 \middle| x_{ijt}\right] = \mathrm{F(X)} = \Phi\left[\alpha_i + \gamma_{\mathrm{t}} + \beta X_{\mathrm{ij,t-1}} + u_{ij,t-1}\right]$$
$$i = 1, \dots, 160; j = 1, \dots, 22;\ t = 1, \dots, 18.$$

where *i* refers to the recipient, *j* refers to the donor and *t* refers to time, the dependent variable $DAH_{ijt}$ equals one if the latent variable $DAH_{ijt}^{*}$ is greater than zero, and zero otherwise, $\Phi$ is the cumulative standard normal distribution function, $\alpha_i$ are recipient-random-effects, $\gamma_{\mathrm{t}}$ are time-fixed-effects, $X_{\mathrm{ij,t-1}}$ is the vector of explanatory variables and $u_{ij,t-1}$ is the disturbance term.

In the second step, the *allocation* decision is estimated via *OLS* with a logged dependent variable *using the* $y_i > 0$ *observations*:

$$\ln\left(DAH_{ijt}\right) = \left[\alpha_i + \gamma_{\mathrm{t}} + \beta X_{\mathrm{ij,t-1}} + v_{ij,t-1}\right], DAH_{ijt} > 0$$
$$i = 1, \dots, 160; j = 1, \dots, 22;\ t = 1, \dots, 18.$$

where *i* refers to the recipient, *j* refers to the donor and *t* refers to time. The dependent variable $\ln\left(DAH_{ijt}\right)$ represents the logarithm of development assistance for health from donor *j* to recipient *i* in

[121] Please refer to chapter 7.3 for the common classification. Japan is another major donor with a share of almost 10% of total health assistance. Unfortunately, it could not be included in the analysis due to computational problems with the maximum likelihood estimation. The analysis focuses on major and like-minded donors because the number of observations for aid allocation decisions by small donors is considerably lower, which may impede robust results.

[122] Donors' preferences, such as expenditures, political transparency or social inequality, are likely to affect the decision-making process (e.g. Faust (2010), Chong and Gradstein (2008)). For disaggregate analyses, such control variables would only make sense if the recipient's perspective were taken. In this case, one would want to control for differences among individual bilateral donors. In our disaggregate analysis, the donor's perspective is taken and hence we control for recipients' characteristics and bilateral relations between donor and recipient.

year $t$.[123] $\alpha_i$ are recipient-random-effects, $\gamma_t$ are time-fixed-effects, $X_{ij,t-1}$ is the vector of explanatory variables and $v_{ij,t-1}$ is the disturbance term. [124]

The error terms are assumed to be each independent over *i*, but may be correlated over *t* for given *i*. All explanatory variables are lagged by one year to model the decision-making process adequately.[125] The recipient random effects control for unobserved country heterogeneity that is assumed to be independently distributed of the regressors. Time fixed effects control for changes over time that affect all recipients equally.[126]

### 8.3.2. Results

Table 23 provides the estimation results for the country selection and aid allocation decisions of major donors. The sample size between first stage and second stage varies because the allocation decision refers to a subsample of the selection decision. It is common to use the same number of observations for all estimations, as far as possible. In this case, it is impossible to restrict the selection sample to the allocation sample because the first part is estimated via probit which needs both selected and unselected countries for the estimation method to work. Hence, the sample size of the allocation stage is smaller. Allocation decisions of all donors are positively correlated with decisions taken in the previous years and, thus, are path dependent.[127]

*France* provides more aid to smaller recipient countries. A 10% decrease in population size is associated with a 3% increase in health assistance. Population size and per capita income have no impact on the selection probability. The coefficient on maternal mortality in the first column suggests that countries with lower mortality rates are more likely to be selected by France.[128] Surprisingly, none of the health indicators affects the allocation of health aid. As regards the institutional environment, on the one hand, recipients with less economic freedom seem to be more likely to be selected. On the other hand, a greater general level of freedom corresponds with more foreign assistance. Higher corruption has a significantly negative impact on health aid provision. The extent of democracy has no impact on the selection probability or aid amount by France. National health expenditures by the recipient increase the selection probability. However, expenditures and immunization rates are

[123] We use constant 2007 dollars in order to adjust for inflation because aid given in 1990 corresponds to higher values in 2007 dollars. As all financial data are recorded in US dollars, there was no need to make currency conversions.

[124] In the trade literature, dyad fixed effects are increasingly used for analyzing dyadic trade flows; they control for distance, historical and cultural ties between states (e.g. Kerner (2009): 89).

[125] As decisions on aid allocation respectively the country selection are made prior to the actual disbursement of aid due to informational time lags, these variables are lagged in order to account for the type of information that was available to the decision-makers at that moment. The choice to lag the independent variables by one period is somewhat arbitrary. Other time lags have been used to test for robustness.

[126] See comments on fixed and random effects in chapter 6.4.

[127] To include the dependent variable as lagged independent variable makes sense from an econometric point of view, but is likely to lower the relative importance of the standard control variables and other independent variables considerably. The dilemma is that, on the one hand, the explanatory power of the overall model increases considerably but that, on the other hand, the factors driving the allocation decision are not better discriminated through the inclusion of the lagged dependent variable as independent variable.

[128] The separate estimation of the health indicators, however, has shown that none of the three has a significant effect on the selection decision. The coefficients of all other variables do not change; neither in significance nor in magnitude.

insignificant with respect to aid provision. In terms of competition among donors, it seems that multilateral aid crowds out French health assistance: A 10% increase in multilateral aid corresponds with 1.9% less aid. The bilateral relations between France and a recipient have a significantly positive impact. Economic links, political integration and a common colonial experience increase the selection probability and the provision of health aid. Commercial ties are the most important bilateral relations: A 10% increase in exports from France to the receiving country is associated with a 4.5% increase in health assistance.

Recipient countries with greater populations are more likely to be selected by *Germany*. Yet, per capita income and population size are insignificant for the German allocation decision. Under-five mortality increases the selection probability but decreases the amount of aid provided. However, in both cases the magnitude is only marginal. Maternal mortality seems to affect the selection probability negatively but has a significantly positive effect on the allocation decision: A one unit increase in maternal mortality is associated with a 4% increase in health assistance.[129] The prevalence of HIV has no significant impact on either decision. The coefficients on proxies for the institutional environment and on proxies for the recipients' effort suggest that they do not affect the selection or the allocation. The German decision-making process is also unaffected by allocation decisions of the United States or multilateral donors. Bilateral relations have no impact on the selection probability but the common colonial past increases the provision of health assistance.

Per capita income, population size and poor health indicators have no impact on the selection probability or the aid provision by *Spain*.[130] Economic freedom increases the selection probability but does not affect the allocation decision. Democratic and freer recipients receive significantly more Spanish health assistance. The corruption level has no impact on either decision. National health expenditures have a significantly negative impact on aid allocation: A one unit increase is associated with 45% less health assistance. The Spanish decision-making process is unaffected by multilateral or US American allocation of health aid. Economic links between Spain and recipient increase the selection probability but are insignificant for the allocation decisions. The coefficient on political integration suggests that less politically integrated recipients receive more health assistance. The distance or the social integration of the recipient is insignificant for either decision.

The *United Kingdom* is more likely to select, and allocates more health aid to poorer and larger recipient countries. A 10% decrease in per capita income is associated with a 7.2% increase in aid and a 10% greater population receives 5.2% more aid on average. The coefficient on HIV prevalence suggests that recipients with high HIV prevalence are more likely to be selected. In addition, they receive more health assistance; however, the economic significance is somewhat marginal, because a 10% higher prevalence rate corresponds with 0.7% more health aid on average by the United

[129] The effect of maternal mortality is inconsistent because the coefficient becomes insignificant when estimated in isolation, both for the selection and the allocation decision. While under-five mortality remains significant in the first case, it also becomes insignificant in the second case. In the separate estimation, the coefficient on rights and liberties suggests a significantly negative effect on the allocation decision.

[130] However, when estimated in isolation, all three health indicators have a significantly positive influence on the selection decision, but remain insignificant in the aid allocation.

Kingdom. The other health indicators are insignificant for the selection and allocation decision. The results suggest that democratic and more corrupt countries are more likely to be selected. The economic freedom and general freedom have no impact on the selection probability. The proxies for institutional quality do not affect the allocation decision by the UK. The immunization rate in the recipient country seems to decrease the selection probability. However, the magnitude of the effect is only marginal. Health expenditures for the national health system do not affect the selection or allocation decision by the UK. Equally, multilateral and US allocation of health assistance has no impact on aid allocation by the UK. Bilateral relations affect the selection probability. The coefficient on political integration suggests that less integrated recipients have greater chances to be selected. Yet, the economic significance is only marginal. The common colonial past has a positive impact on the selection decision. Contrary to expectations, bilateral relations do not influence the allocation decisions.

The *United States* is more likely to select poor and large recipient countries. Per capita income also influences aid allocation: A 10% decrease in income corresponds with a 3.4% increase in health assistance. The population size has no impact on the allocation decision. HIV prevalence has a significantly positive effect on the selection portability and the aid provision: A 10% higher prevalence rate corresponds with 0.4% more health assistance. Maternal mortality and under-five mortality do not affect selection or allocation decisions by the US. The economic freedom of a recipient country seems to increase the selection probability, however, it is insignificant for the allocation decision. Generally speaking, proxies for institutional factors do not affect the US health assistance. Health expenditures and immunization rates are insignificant for the selection and allocation decision. Multilateral health provision does not affect the aid allocation by the US. Bilateral relations have a significant impact on the decision-making process. Less politically integrated recipients are marginally more likely to be selected. Geographically close recipients have a greater selection probability. Nevertheless, economic links between the US and receiving countries are the decisive factor for the allocation decision: 10% higher exports correspond with almost 2% more health assistance.[131]

[131] In the case of Spain and the United States, we tested in addition for the influence of a colonial relationship between other donors and recipients. Contrary to our expectations, we did not find any evidence that these recipient countries are less likely to be selected.
The variable *other colony* measures the logged number of years since 1900 in which the country was the colony of another donor.

Table 23. Estimation results: Selection and allocation decisions of major donors

| | **Major donors** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | France | | Germany | | Spain | | UK | | USA | |
| | I | II | I | II | I | II | I | II | I | II |
| *Control variables* | | | | | | | | | | |
| (ln) GDPpc | 0.0343 | -0.2982 | -0.0056 | -0.1118 | -0.0961 | 0.2016 | -0.1102 | -0.7161 | -0.1213 | -0.3353 |
| | (0.47) | (-1.12) | (-0.08) | (-0.77) | (-1.62) | (0.58) | (-2.00)** | (-2.38)** | (-2.37)** | (-3.07)*** |
| (ln) Population | -0.0285 | -0.2922 | 0.0975 | 0.1684 | 0.0671 | -0.1173 | 0.1731 | 0.5231 | 0.0675 | -0.1069 |
| | (-0.74) | (-2.14)** | (1.65)* | (1.25) | (1.45) | (-0.40) | (2.88)*** | (2.59)*** | (1.73)* | (-1.04) |
| *Health indicators* | | | | | | | | | | |
| Under-five mortality | 0.0015 | -0.0039 | 0.0059 | -0.0053 | 0.0008 | 0.0020 | -0.0006 | -0.0029 | 0.0004 | 0.0008 |
| | (0.89) | (-0.67) | (2.07)** | (-2.01)** | (0.52) | (0.29) | (-0.42) | (-0.69) | (0.28) | (0.27) |
| Maternal mortality | -0.0332 | -0.0715 | -0.0456 | 0.0398 | 0.0157 | -0.0760 | -0.0067 | -0.0285 | -0.0160 | -0.0317 |
| | (-1.78)* | (-1.09) | (-2.05)** | (1.96)* | (0.90) | (-1.27) | (-0.40) | (-0.57) | (-1.05) | (-0.86) |
| HIV prevalence | 0.0093 | 0.0435 | 0.0042 | 0.0121 | 0.0072 | 0.0700 | 0.0174 | 0.0668 | 0.0222 | 0.0360 |
| | (1.39) | (1.09) | (0.69) | (0.88) | (1.07) | (1.38) | (2.44)** | (2.17)** | (3.07)*** | (2.71)*** |
| *Environment* | | | | | | | | | | |
| Democracy | -0.0084 | -0.0164 | 0.0007 | -0.0017 | 0.0011 | 0.0983 | 0.0066 | 0.0412 | 0.0022 | 0.0093 |
| | (-1.56) | (-0.67) | (0.17) | (-0.16) | (0.19) | (2.13)** | (1.65)* | (1.27) | (0.55) | (0.74) |
| Economic freedom | -0.0895 | -0.1610 | 0.0292 | 0.0170 | 0.0798 | -0.1441 | -0.0176 | -0.1392 | 0.0528 | 0.0384 |
| | (-1.92)* | (-1.37) | (0.56) | (0.19) | (1.97)** | (-0.40) | (-0.51) | (-1.32) | (1.82)* | (0.38) |
| Rights and liberties | -0.0112 | 0.1731 | -0.0088 | -0.0656 | -0.0125 | 0.2244 | -0.0048 | 0.0623 | -0.0027 | 0.0136 |
| | (-0.73) | (1.83)* | (-0.67) | (-1.55) | (-0.83) | (1.78)* | (-0.42) | (0.80) | (-0.39) | (0.30) |
| Corruption | 0.0225 | -0.1158 | 0.0014 | 0.0076 | -0.0063 | -0.0316 | 0.0188 | 0.0389 | 0.0044 | -0.0480 |
| | (1.25) | (-1.93)* | (0.15) | (0.26) | (-0.56) | (-0.33) | (2.21)** | (0.72) | (0.73) | (-1.23) |
| *Effort* | | | | | | | | | | |
| Health expenditures | 0.0829 | -0.1215 | -0.0004 | -0.0771 | 0.0245 | -0.4457 | -0.0384 | -0.0215 | -0.0403 | -0.1179 |
| | (1.85)* | (-0.48) | (-0.01) | (-0.95) | (0.69) | (-2.16)** | (-1.32) | (-0.16) | (-1.61) | (-1.14) |
| Immunization | 0.0012 | 0.0096 | 0.0008 | -0.0004 | -0.0026 | 0.0168 | -0.0047 | -0.0075 | -0.0005 | -0.0021 |
| | (0.51) | (0.85) | (0.35) | (-0.09) | (-1.20) | (1.46) | (-2.37)** | (-1.06) | (-0.38) | (-0.55) |
| *Competition* | | | | | | | | | | |
| (ln) US aid | - | -0.0070 | - | -0.0311 | - | -0.0652 | - | 0.1669 | - | - |
| | | (-0.09) | | (-0.79) | | (-1.05) | | (1.23) | | |
| (ln) Multilateral aid | - | -0.1869 | - | 0.0403 | - | 0.2927 | - | -0.0265 | - | 0.0335 |
| | | (-1.73)* | | (0.84) | | (0.98) | | (-0.41) | | (0.78) |
| *Bilateral relations* | | | | | | | | | | |
| (ln) Exports | 0.0615 | 0.4550 | -0.0274 | 0.0219 | 0.0476 | 0.1363 | -0.0372 | 0.0410 | 0.0195 | 0.1803 |
| | (1.96)** | (2.13)** | (-0.47) | (0.29) | (1.88)* | (0.63) | (-1.44) | (0.26) | (0.71) | (2.34)** |
| Political integration | 0.0083 | 0.0180 | -0.0014 | 0.0001 | 0.0015 | -0.0379 | -0.0047 | -0.0189 | -0.0049 | -0.0047 |
| | (2.40)** | (1.68)* | (-0.61) | (0.02) | (0.51) | (-1.79)* | (-1.65)* | (-1.56) | (-2.54)** | (-0.98) |
| Social integration | -0.0055 | -0.0315 | -0.0030 | -0.0121 | -0.0002 | -0.0021 | 0.0012 | 0.0226 | 0.0015 | -0.0012 |
| | (-1.26) | (-1.00) | (-0.69) | (-1.20) | (-0.04) | (-0.06) | (0.21) | (1.07) | (0.53) | (-0.12) |
| (ln) Own colony | 0.1052 | 0.1999 | 0.0632 | 0.1250 | - | - | 0.0541 | 0.1168 | - | - |
| | (2.52)** | (2.39)** | (1.00) | (2.00)** | | | (1.74)* | (1.36) | | |
| (ln) Distance | -0.1261 | 0.3517 | 0.0513 | -0.0660 | -0.1149 | -0.7188 | 0.0015 | -0.1146 | -0.1882 | 0.2639 |
| | (-1.13) | (0.75) | (0.53) | (-0.34) | (-1.36) | (-1.47) | (0.01) | (-0.27) | (-2.44)** | (1.43) |
| (ln) Aid | - | 0.6204 | - | 0.6460 | - | 0.4680 | - | 0.4095 | - | 0.8300 |
| | | (4.88)*** | | (6.41)*** | | (4.21)*** | | (3.89)*** | | (16.58)*** |
| Observations | 300 | 149 | 300 | 194 | 299 | 128 | 300 | 138 | 478 | 337 |
| No. of groups | 49 | 32 | 49 | 40 | 49 | 30 | 49 | 27 | 68 | 59 |
| log likelihood | -77.7875 | - | -35.7786 | - | -80.4737 | - | -64.2079 | - | -116.2480 | - |
| R-squared overall model | - | 0.7836 | - | 0.7197 | - | 0.4206 | - | 0.7763 | - | 0.7965 |

(I) Dependent variable is selection probability (1 = receives aid; 0 = does not receive aid). Estimates are based on probit maximum likelihood procedure, Gauss-Hermite adaptive quadrature with 24 quadrature points. t-statistics are reported below the marginal coefficient estimates. (II) Dependent variable is logged aid. OLS estimates of lognormal hurdle model. t-statistics are reported below the coefficient estimates. - Robust standard errors. All equations include year-specific time dummies. Coefficient of constant not reported. All time-varying regressors are lagged by one year. ***, **, * denote significance at 1, 5, and 10 percent, respectively. The sample varies between selection stage respectively the allocation stage of donors due to data availability for some variables. The sample for the allocation decision is smaller by definition: While the selection decision included selected and non-selected recipients, the allocation decision includes only the subsample of selected recipients.

Table 24 reports the estimation results for the decision-making process of like-minded donors. The allocation decisions of all like-minded donors also depend on the allocation process of the previous year.

*Canada* is more likely to select poor recipient countries. Yet, per capita income and population size have no impact on the provision of health assistance. The coefficient on HIV prevalence suggests that high prevalence rates correspond with greater selection probability. The other health indicators do not affect the selection process.[132] Interestingly, none of the three health indicators has a significant effect on the allocation of health aid. The corruption level of a recipient has a positive impact on the selection process but a negative effect on the provision of health assistance. A one unit higher corruption level is associated with a 10% decrease in aid allocation. The other institutional factors are insignificant for selection and allocation decision. Health expenditures and immunization rates have no effect on the decision-making process. Multilateral aid allocation is complemented by Canadian health assistance: 10% higher multilateral aid is associated with 1.6% more health aid. Bilateral relations affect the selection probability by Canada but do not influence the allocation decisions with respect to health assistance. Economic and political links have a significantly positive influence on the selection process. Close recipient countries are more likely to be selected.

*Denmark* allocates more health assistance to poorer recipient countries. 10% lower per capita income is associated with 10% more health aid. The population size is irrelevant for the allocation decision. Income and population have no significant effect on the selection process. The maternal mortality has a significantly negative impact on selection and allocation: A 10% lower mortality rate corresponds with almost 20% more health assistance.[133] The coefficient of HIV prevalence suggests that high prevalence increases the selection probability. However, it does not affect the allocation decision. Democratic, freer and less corrupt recipients are more likely to be selected by Denmark. In terms of aid allocation, the level of economic freedom has a significantly positive impact on health assistance: One unit more economic freedom corresponds with 65% higher aid. National health expenditures by the recipient decrease the selection chances. Yet, neither health expenditures nor immunization significantly affect the allocation process. US aid allocation has a significantly positive effect on Danish health assistance: A 10% increase is associated with 2.3% more Danish aid. Bilateral relations between donor and recipient do not affect the decision-making process.

The *Netherlands* is more likely to select and provide more health assistance to poorer recipients: 10% less per capita income of the recipient country corresponds with almost 12% higher aid provision. The Netherlands also allocated more aid to smaller countries: A recipient with 10% less population receives 7% more health assistance on average. Lower maternal mortality and higher HIV prevalence

[132] Estimated separately, also maternal mortality has a significant positive impact on the selection probability, with the coefficients of the other variables largely remaining the same.

[133] When the health estimators are separately controlled for, maternal mortality does neither have a significant impact on the selection decision nor on the allocation decision.

increase the selection probability.[134] Yet, none of the health indicators has a significant effect on the allocation of health assistance. A democratic country is more likely to be selected by the Netherlands. However, neither democracy nor freedom nor corruption is significant for the allocation decision. Health expenditures by the recipient decrease the selection probability but do not significantly affect the allocation of health aid. Immunization rates are insignificant for the selection decision but have a significantly positive effect on aid provision: A 10% higher immunization rate is associated with 0.5% more health assistance. The allocation decisions of multilateral donors or the United States have no impact on the Dutch allocation process. Bilateral relations are insignificant for the selection decision but affect the allocation decision positively: 10% more exports to the recipient correspond with 3.8% more health aid. A one unit increase on the political integration means 3.3% more assistance on average. The Dutch allocation decisions are geographically biased because a 1% greater distance is associated with 2.2% more health aid provision.

*Norway* is more likely to select poorer and larger recipients. Per capita income and population size have no effect on the allocation decision. HIV prevalence has a significantly positive effect on the selection probability. Surprisingly, none of the health indicators affects the allocation decision.[135] Economic freedom and corruption increase the selection probability significantly. However, the proxies for the institutional environment of the recipient have no significant impact on the allocation decision for health assistance. The coefficient of immunization rate suggests that one unit increase in immunization coverage corresponds with 1.4% more health assistance. Hence, the recipients' efforts are complemented with higher aid allocations on average. The allocation decisions of multilateral donors and the United States have no effect on the Norwegian decision-making process. While bilateral relations are insignificant for the selection probability, the coefficient on political integration suggests that politically less integrated recipients receive 1% more health aid on average.

Recipient countries with greater populations are more likely to be selected by *Sweden*. The per capita income and population size have no effect on the allocation decision. Higher under-five mortality, lower maternal mortality and higher HIV prevalence increase the selection probability.[136] However, the health indicators are insignificant for the allocation of health assistance.[137] Institutional aspects have no impact on the selection decision. However, it seems that less democratic and economically freer countries receive more health aid: A one unit less democratic country receives 7.3% more assistance; a one unit increase in economic freedom means 43% more aid. The corruption level has no significant effect on the allocation decision. Higher immunization rates seem to increase the selection probability. However, neither a recipient's health expenditures nor the immunization

[134] Again, the coefficient of maternal mortality becomes insignificant, when estimated in isolation, while the coefficients of the other variables are not affected.

[135] In separate estimations, however, maternal mortality, as only health indicator, has a significantly positive impact on the allocation decision. A 1% increase in maternal mortality is associated with 6.6% more health assistance.

[136] Under-five mortality and HIV prevalence continue to have a significantly positive effect on the selection decision, when estimated separately.

[137] Estimated in isolation, maternal mortality has a significant positive impact on the allocation decision, with the coefficients of the other variables being unaffected. A 1% increase in maternal mortality is associated with 15.6% more health assistance.

coverage influence the allocation process of health aid significantly. Multilateral health aid appears to crowd out Swedish health assistance: 10% more multilateral aid is associated with roughly 2% less Swedish aid. Bilateral relations between Sweden and the recipient country have no significant effect for the Swedish decision-making process.

Table 24. Estimation results: Selection and allocation decisions of like-minded donors

| | **Like-minded donors** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Canada | | Denmark | | Netherlands | | Norway | | Sweden | |
| | I | II | I | II | I | II | I | II | I | II |
| *Control variables* | | | | | | | | | | |
| (ln) GDPpc | -0.3227 | -0.1215 | -0.1443 | -1.0144 | -0.1152 | -1.1647 | -0.1120 | -0.2184 | -0.0311 | -0.2005 |
| | (-4.38)*** | (-0.46) | (-1.46) | (-3.20)*** | (-1.65)* | (-2.06)** | (-1.67)* | (-0.87) | (-0.56) | (-1.11) |
| (ln) Population | 0.0511 | -0.0819 | 0.0746 | 0.1790 | 0.0519 | -0.7139 | 0.1217 | 0.1306 | 0.0685 | 0.2434 |
| | (1.03) | (-0.44) | (0.84) | (0.50) | (0.97) | (-2.00)** | (2.37)** | (0.81) | (2.00)** | (1.51) |
| *Health indicators* | | | | | | | | | | |
| Under-five mortality | -0.0014 | 0.0038 | 0.0017 | 0.0138 | 0.0014 | 0.0054 | -0.0001 | -0.0008 | 0.0021 | 0.0039 |
| | (-0.84) | (0.70) | (0.66) | (1.53) | (0.73) | (0.55) | (-0.11) | (-0.26) | (2.00)** | (0.84) |
| Maternal mortality | 0.0059 | 0.0061 | -0.0583 | -0.1879 | -0.0541 | -0.0949 | -0.0271 | 0.0551 | -0.0249 | 0.1057 |
| | (0.28) | (0.10) | (-1.86)* | (-2.06)** | (-1.90)* | (-0.86) | (-1.53) | (1.63) | (-1.93)* | (1.42) |
| HIV prevalence | 0.0367 | 0.0316 | 0.0404 | 0.0332 | 0.0519 | -0.0330 | 0.0552 | 0.0230 | 0.0417 | 0.0160 |
| | (3.68)*** | (0.97) | (3.00)*** | (0.69) | (2.87)*** | (-1.08) | (2.55)** | (1.00) | (3.08)*** | (0.77) |
| *Environment* | | | | | | | | | | |
| Democracy | 0.0097 | -0.0377 | 0.0151 | 0.0309 | 0.0138 | -0.0317 | 0.0052 | -0.0090 | 0.0009 | -0.0734 |
| | (1.53) | (-1.28) | (1.74)* | (0.79) | (2.45)** | (-0.58) | (0.99) | (-0.66) | (0.23) | (-2.88)*** |
| Economic freedom | 0.0483 | 0.0721 | 0.0904 | 0.6528 | -0.0610 | 0.2820 | 0.0975 | 0.1313 | 0.0559 | 0.4310 |
| | (1.01) | (0.42) | (1.31) | (1.80)* | (-1.30) | (1.11) | (1.74)* | (1.14) | (1.38) | (2.83)*** |
| Rights and liberties | -0.0188 | -0.0118 | 0.0496 | 0.0311 | -0.0074 | -0.0428 | 0.0252 | 0.0050 | 0.0122 | -0.0390 |
| | (-1.42) | (-0.15) | (2.08)** | (0.26) | (-0.61) | (-0.39) | (1.60) | (0.12) | (1.13) | (-0.68) |
| Corruption | 0.0215 | -0.0964 | -0.0518 | -0.2092 | -0.0038 | 0.0770 | 0.0441 | -0.0093 | -0.0103 | 0.0605 |
| | (1.72)* | (-2.06)** | (-2.15)** | (-0.78) | (-0.35) | (0.49) | (2.35)** | (-0.29) | (-0.95) | (0.75) |
| *Effort* | | | | | | | | | | |
| Health expenditures | 0.0295 | 0.1190 | -0.1302 | 0.4063 | -0.1559 | 0.2798 | -0.0049 | -0.0470 | -0.0087 | 0.0092 |
| | (0.81) | (1.09) | (-2.37)** | (1.04) | (-2.40)** | (1.05) | (-0.12) | (-0.41) | (-0.29) | (0.07) |
| Immunization | -0.0022 | -0.0009 | 0.0017 | 0.0197 | -0.0020 | 0.0474 | -0.0006 | 0.0143 | 0.0048 | 0.0060 |
| | (-0.98) | (-0.10) | (0.56) | (0.85) | (-0.85) | (2.66)*** | (-0.34) | (1.66)* | (2.39)** | (0.57) |
| *Competition* | | | | | | | | | | |
| (ln) US aid | - | 0.0840 | - | 0.2322 | - | 0.1745 | - | 0.0438 | - | 0.1126 |
| | | (1.08) | | (2.17)** | | (1.23) | | (1.02) | | (1.56) |
| (ln) Multilateral aid | - | 0.1611 | - | -0.2465 | - | -0.0642 | - | -0.0715 | - | -0.1994 |
| | | (1.82)* | | (-1.02) | | (-0.31) | | (-1.09) | | (-1.98)** |
| *Bilateral relations* | | | | | | | | | | |
| (ln) Exports | 0.0656 | 0.0355 | 0.0238 | 0.0782 | 0.0148 | 0.3757 | -0.0107 | 0.0335 | 0.0176 | -0.0337 |
| | (1.89)* | (0.24) | (0.42) | (0.42) | (0.34) | (1.70)* | (-0.60) | (0.34) | (0.81) | (-0.38) |
| Political integration | 0.0052 | 0.0086 | -0.0053 | -0.0128 | 0.0033 | 0.0329 | -0.0043 | -0.0105 | -0.0033 | 0.0098 |
| | (2.02)** | (0.64) | (-1.24) | (-0.75) | (1.07) | (1.68)* | (-1.33) | (-1.68)* | (-1.58) | (0.97) |
| Social integration | 0.0039 | -0.0125 | -0.0016 | 0.0364 | 0.0047 | -0.0273 | -0.0100 | -0.0007 | -0.0009 | -0.0002 |
| | (0.75) | (-0.65) | (-0.20) | (0.59) | (0.90) | (-0.70) | (-1.39) | (-0.05) | (-0.24) | (-0.01) |
| (ln) Own colony | - | - | - | - | 0.0133 | -0.1424 | - | - | - | - |
| | | | | | (0.18) | (-0.83) | | | | |
| (ln) Distance | -0.3301 | -0.4295 | 0.2547 | -0.8617 | 0.0459 | 2.1946 | -0.0375 | -0.3724 | -0.0280 | 0.0156 |
| | (-2.96)*** | (-1.09) | (0.96) | (-1.20) | (0.33) | (2.27)** | (-0.31) | (-0.78) | (-0.33) | (0.02) |
| (ln) Aid | - | 0.5393 | - | 0.4528 | - | 0.3934 | - | 0.7284 | - | 0.6680 |
| | | (6.42)*** | | (4.30)*** | | (2.57)** | | (6.52)*** | | (9.86)*** |
| Observations | 478 | 184 | 290 | 89 | 300 | 107 | 289 | 155 | 290 | 103 |
| No. of groups | 68 | 43 | 46 | 21 | 49 | 24 | 46 | 30 | 46 | 33 |
| log likelihood | -178.5490 | - | -81.1701 | - | -103.4407 | - | -58.2759 | - | -53.7874 | - |
| R-squared overall model | - | 0.6026 | - | 0.6834 | - | 0.7060 | - | 0.7266 | - | 0.8871 |

(I) Dependent variable is selection probability (1 = receives aid; 0 = does not receive aid). Estimates are based on probit maximum likelihood procedure, Gauss-Hermite adaptive quadrature with 24 quadrature points. t-statistics are reported below the marginal coefficient estimates. (II) Dependent variable is logged aid. OLS estimates of lognormal hurdle model. t-statistics are reported below the coefficient estimates. - Robust standard errors. All equations include year-specific time dummies. Coefficient of constant not reported. All time-varying regressors are lagged by one year. ***, **, * denote significance at 1, 5, and 10 percent, respectively. The sample varies between selection stage respectively the allocation stage of donors due to data availability for some variables. The sample for the allocation decision is smaller by definition: While the selection decision included selected and non-selected recipients, the allocation decision includes only the subsample of selected recipients.

The estimation results for the decision-making of major and bilateral donors are summarized in Table 25.

Table 25. Overview of estimation results for the decision-making of major and like-minded donors

| | **Major donors** | | | | | | | | | | **Like-minded donors** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | France | | Germany | | Spain | | UK | | US | | Canada | | Denmark | | Netherlands | | Norway | | Sweden | |
| | I | II | I | II | I | II | I | II | I | II | I | II | I | II | I | II | I | II | I | II |
| *Control variables* | | | | | | | | | | | | | | | | | | | | |
| (ln) GDPpc | | | | | | | - | - | - | - | - | | | - | - | - | - | | | |
| (ln) Population | | - | + | | | | + | + | + | | | | | | | - | + | | + | |
| *Health indicators* | | | | | | | | | | | | | | | | | | | | |
| Under-five mortality | | | + | - | | | | | | | | | | | | | | | + | |
| Maternal mortality | - | | - | + | | | | | | | | | - | - | - | | | | - | |
| HIV prevalence | | | | | | | + | + | + | + | + | | + | | + | | + | | + | |
| *Environment* | | | | | | | | | | | | | | | | | | | | |
| Democracy | | | | | | + | + | | | | | | + | | + | | | | | - |
| Economic freedom | - | | | | + | | | | + | | | | | + | | | + | | | + |
| Rights and liberties | | + | | | | + | | | | | | | + | | | | | | | |
| Corruption | | - | | | | | + | | | | + | - | - | | | | + | | | |
| *Effort* | | | | | | | | | | | | | | | | | | | | |
| Health expenditures | + | | | | | - | | | | | | | - | | - | | | | | |
| Immunization | | | | | | | - | | | | | | | | | + | | + | + | |
| *Competition* | | | | | | | | | | | | | | | | | | | | |
| (ln) US aid | n.a. | | n.a. | | n.a. | | n.a. | | n.a. | n.a. | n.a. | | n.a. | + | n.a. | | n.a. | | n.a. | |
| (ln) Multilateral aid | n.a. | - | n.a. | | n.a. | | n.a. | | n.a. | | n.a. | + | n.a. | | n.a. | | n.a. | | n.a. | - |
| *Bilateral relations* | | | | | | | | | | | | | | | | | | | | |
| (ln) Exports | + | + | | | + | | | | | + | + | | | | | + | | | | |
| Political integration | + | + | | | | - | - | | - | | + | | | | | + | | - | | |
| Social integration | | | | | | | | | | | | | | | | | | | | |
| (ln) Own colony | + | + | | + | | | + | | | | | | | | | | | | | |
| (ln) Distance | | | | | | | | | - | | - | | | | | + | | | | |
| (ln) Aid | n.a. | + | n.a. | + | n.a. | + | n.a. | + | n.a. | + | n.a. | + | n.a. | + | n.a. | + | n.a. | + | n.a. | + |
| Observations | 300 | 149 | 300 | 194 | 299 | 128 | 300 | 138 | 478 | 337 | 478 | 184 | 290 | 89 | 300 | 107 | 289 | 155 | 290 | 103 |

Note: I = selection decision, II = allocation decision; (+) = significant positive effect, (-) = significant negative effect; n.a. = not included in estimation

### 8.3.3. Sensitivity analysis

A longer time lag of two years affects some coefficients but does not change the general results of the selection decision. The majority of the donors are more likely to select poor recipients. Only Norway, Sweden and Finland are more likely to select more populous countries. As regards health indicators, HIV prevalence has a significantly positive impact on the selection probability of most donors. If maternal mortality is significant, the coefficients suggest a significantly negative impact, with the exception of Spain. Under-five mortality is insignificant for the selection decisions, except Sweden and Switzerland. However, the economic significance is only marginal and not comparable to the effects of other health indicators. The variables that are most sensitive to a change in the time lag are the proxies of the institutional environment. Rights and liberties only have a significantly positive effect on the US selection decision. Economic freedom increases the selection probability in the case of the US and Sweden but decreases it in the case of France. The level of democracy only has a significantly positive impact on the Dutch selection decision. Corruption becomes insignificant for the selection decision of major and like-minded donors. When a longer time lag is used, the statistical significance of the recipients' efforts disappears. Norway is the only donor whose selection decision is marginally positively affected by the immunization coverage. As regards bilateral relations, the most remarkable difference is that economic links have a statistically and economically significantly positive effect on the selection probability of many donors. The other changes are only small in magnitude.

Most of the results on bilateral aid allocation behavior are robust to a change in the time lag. The estimation results of France and Denmark are most affected. The French allocation decision seems to be less strongly based on bilateral relations than the original results would suggest, because bilateral relations no longer have a significant impact. Population size becomes insignificant for the allocation decision. The importance of general freedom vanishes but recipients with less economic freedom receive more aid. The tendency that less corrupt countries are provided with more health assistance is maintained however. While multilateral aid is no longer significant, the coefficient on US aid allocation has a significant but only marginally negative effect. In general, the coefficients, whose statistical significance changes, have a rather small economic significance. In other words, the overall result that the French allocation decision for health assistance is not based on poor health indicators of the recipients remains the same. With respect to Denmark, the most remarkable difference is visible in the health indicators. Maternal mortality no longer has a significantly negative effect. Under-five mortality has a significantly positive effect, while HIV prevalence has a significantly negative impact. These results suggest that Denmark bases its allocation decision more strongly on health indicators than the initial estimates would suggest. However, the Danish allocation decision is not consistently based on poor health indicators.

The results for the control variables per capita income and population size are very robust to the change in the time lag. The results for health indicators suggest a stronger and more consistent

orientation at poor health indicators than the initial results. The French, Spanish, Dutch and Swedish allocation decisions for health assistance are not affected by the poor health indicators of the recipient country. Germany and Norway provide more health aid to countries with high maternal mortality: a one unit increase is associated with 8% respectively 10% higher aid allocation. The UK provides 9% more health assistance to recipients with high HIV prevalence and 12% more to countries with high maternal mortality. Under-five mortality has a significantly negative effect on British aid allocation; however, the economic significance is small, at 1%. The evidence for the United States is similar: Recipients with high HIV prevalence receive 7% more health assistance on average. Countries with high under-five mortality are allocated approximately 2% less. HIV prevalence also has a significantly positive impact on the Canadian allocation decision: A one unit increase corresponds to 7% more health assistance. The results of the robustness check hence imply that some donors do not consider the health situation in the recipient country when allocating health assistance. When poor health indicators are important, then HIV prevalence and maternal mortality are the decisive factors. Under-five mortality does not have a significantly positive influence on the allocation decision by any bilateral donor. The results for the proxies of the institutional environment are only slightly affected. Rights and liberties have a significantly positive effect on Spanish allocation decisions. Economic freedom increases the aid provision by the United States. The corruption level is no longer significant for the Canadian decision process, but Norway allocates more health aid to less corrupt countries. Health expenditures lower the aid provision by the US and Sweden and are insignificant for Spain. A recipient's immunization coverage however has a significantly positive impact on Spanish health assistance. With a longer time lag, the importance of multilateral aid disappears with the exception of Canada. The US allocation decision has a significantly positive impact on the UK, Canada and Norway. The effect of bilateral relations generally stays the same.

The second robustness test replaced per capita income with the Human Development Index (HDI) as more general development indicator, since countries with similar income can be very different in their human development (UNDP (1999), 129). When controlling for the general level of development, the results remain largely the same. Norway is the only donor that is more likely to select less developed countries more likely. Spain and Canada give preference to more populous countries. The population size of the recipient no longer has a significant impact on the German selection decision. The results for the health indicators suggest that HIV prevalence has a significantly positive effect on the selection decision by all like-minded donors and most major donors. The maternal mortality continues to have a significantly negative effect. The under-five mortality continues to be insignificant with the exception of Germany whose coefficient suggests a positive effect. As regards the institutional environment, the results are largely unaffected. The Netherlands is less likely to select a recipient with greater economic freedom, while Norway is more likely to select a country with more rights and liberties. The coefficients on the indicators of recipients' efforts remain largely the same. The United States is less

likely to select a country with high national health expenditures. The only remarkable change in terms of bilateral relations is that social integration/globalization of the recipient decreases the selection probability by Norway.

While the estimation results of the other coefficients of the allocation decision remain largely the same, the results for the HDI are different from the results for per capita income. Spain, Norway and Sweden allocate up to 7% more health assistance to less developed recipients. When the development level is controlled for, Norway and Sweden allocated more aid to more populous countries but France no longer favors small recipient countries. In general, the estimation results for Norway are most affected. Maternal mortality increases the health assistance by Norway, while under-five mortality slightly decreases it. Similar to the previous results for Sweden, Norway provides more health aid to less democratic but more economically free countries (with the latter effect being ten times greater). Allocations by multilateral donors reduce Norwegian health assistance. All other coefficient estimates for the remaining donors remain largely unaffected.

We dropped transition countries from our sample in order to test for possible outliers. The results remain largely unaffected. Per capita income has no significant effect on the selection decision by the Netherlands and Norway. Maternal mortality is insignificant for the French selection for health assistance. The only noteworthy changes with respect to the importance of the institutional environment are that corruption is insignificant for the Canadian decision but has a significantly negative effect on the Finish and Italian decisions. In other words, in the latter cases more corrupt countries are less likely selected. Economic freedom has a significantly positive impact on the selection decision by Luxembourg. The results for recipients' efforts and bilateral relations are unaffected.

The estimation results for the allocation decision are not affected by possible outliers such as transition countries. However, the sample of the robustness test is very similar to the original sample. In fact, only the estimations for France, Germany, the US and Sweden could be tested for robustness because the number of observations remained the same for the other donors.

### 8.3.4. Concluding remarks

The previous disaggregate analysis of the decision-making process of major and like-minded donors reveals the great heterogeneity among donors as well as the differences between selection and allocation stage. As far as the importance of health indicators is concerned, the prevalence rate of HIV is the only health indicator that has a consistent effect on the decision-making process of many bilateral donors. A high prevalence rate increases the selection probability for health assistance in seven out of ten cases, but increases the allocated health assistance only in the case of the UK and the US. This means that, high HIV prevalence is a recipient characteristic that increases the selection chances but not the actual aid allocation. In comparison, under-five mortality and maternal mortality

are much less important for the decision-making process. A recipient country with a high maternal mortality has a lower selection probability with respect to every second donor. Germany allocates more health assistance to these recipients, while Denmark allocates less. High under-five mortality increases the selection probability in the case of Germany and Sweden. When it comes to the allocation decision, however, Germany allocates less to recipients with high mortality rates. At that stage, the mortality rate is insignificant for the Swedish allocation decision.

The separate estimations of health indicators in the selection and the allocation equations have revealed the effect of maternal mortality as inconsistent. While maternal mortality usually becomes insignificant when estimated in isolation, in some cases, it is another health indicator, or even the only health indicator, with a significant positive effect on the decisions.

Our estimation results show that health indicators are not as important for the selection respectively the allocation decisions of major and like-minded donors as initially expected. One possible explanation is provided by the large confidence limits of health indicators, which probably motivate the use of alternative figures of neediness. Yet, per capita income, as a broader measure of recipient need, does not consistently affect the decision-making process either. In addition, the estimation results do not indicate any pattern in which per capita income systematically substitutes health indicators. On the other hand, a strong argument against using alternative indicators to assess recipient need is the underestimation of health figures due to underreported cases. Therefore, national averages serve as rule of thumb in order to get a sense for the health circumstances of particularly poor people, as these figures mark the lower bottom and the actual situation is in all likelihood worse.

Per capita income, as standard measure for poverty, affects the selection decision of each second bilateral donor but the allocation decision of only four out of ten. Different from other variables, per capita income has a consistently negative effect when it is significant. This means that poor countries are not only more likely to be selected but also receive greater shares of health assistance. Regarding the different groups of bilateral donors, there is no evidence that like-minded donors allocate their health assistance systematically to poorer countries, which refutes the myth that they are more poverty concerned.

The quality of the institutional environment influences eighty percent of the selection decisions and fifty percent of the allocation decisions. Germany is the only donor for whose decision-making process institutional factors are irrelevant. When these factors matter, democratic countries, recipients with economic freedom, and countries with general freedom are more likely to be selected or receive higher aid allocations. In all cases, the effect is statistically significant for either the selection decision or the allocation decision; never for both stages. The effect of corruption in the recipient country on the donor behavior is less consistent. One third of the donors selects less corrupt countries more likely. The level of corruption affects the allocation decision of only two out of ten donors which allocate less health assistance to corrupt recipients. Although the quality of the institutional environment significantly influences the decision-making process of most donors, first, no pattern for the individual

donor is visible and, second, no evidence for a systematic difference between major and like-minded donors is found.

The national expenditures for public health by the recipient have no systematic effect on the bilateral decision-making. One donor rewards high health expenditures with a greater selection probability, while two donors select such recipients less likely. The health expenditures affect the allocation decision of only one donor, which allocates less health assistance. In other words, the national expenditures for public health are irrelevant for the decision-making process of the great majority of bilateral donors. High immunization coverage triggers attention visible in a greater selection probability in only one case. Yet, high coverage has the opposite effect for another donor. In two cases, high immunization rates increase the allocation of health assistance. This means that the coverage rate is irrelevant for the decision-making process of most bilateral donors. In any case, a higher selection probability translates into greater provision of health assistance and vice versa. The two indicators might not be adequate proxies to measure recipient's effort. One, health expenditures can be interpreted as indicator for the capacity of the national government, which means a different measure for recipient need and no longer a measure for recipient merit. Two, immunization coverage does not allow for discriminating efforts of the national government from contributions of the international donor community.

The allocation pattern of US health assistance, respectively multilateral aid, is irrelevant for the allocation decision of almost all donors. For only one out of ten donors, the bilateral donor allocates more health aid to recipients which also received US health assistance. One out of ten donors complements multilateral aid with own health assistance to these countries, while two out of ten allocate less health assistance to recipients which also received multilateral aid.

The several types of relationships between donor and recipient have very different effects on the selection and the allocation decision. Economic links increase the selection probability as well as the allocated health assistance in thirty percent of the decisions. Political ties increase the selection probability in two out of ten cases but decrease the selection probability in as many, while they increase the allocated health assistance in two cases but decrease it in as many. Social integration is insignificant for the decision-making process. Historic links increase the selection probability respectively the allocation in two cases. Geographic proximity increases the selection probability in two cases but decreases the allocation in one case. The pattern for France is an exception because it is the only donor for which higher selection probability translates into higher aid allocation for the respective bilateral link. Denmark and Sweden are exceptional because bilateral relations are insignificant for both their selection and their allocation decision. In general, bilateral relations have a greater effect on the decision-making process of major donors than on like-minded donors. Overall, the relationship between donor and recipient has a surprisingly strong impact on the decision-making process for health assistance of bilateral donors.

Our results cannot be compared directly to the results of previous research on aid allocation, because this study focuses on sector-specific aid, includes observations for a longer time period than many other studies, and analyzes more aspects than most others. With that being said, the preference for poor countries is in accordance with the existing literature. The often found population bias towards more populous countries cannot be consistently confirmed. The result that HIV/Aids is the decisive health indicator is in line with previous findings that the fight against HIV/Aids shapes the allocation of aid (Thiele et al. (2007), 622). Our analysis provides additional evidence that the institutional environment matters for the decision-making process, but with large differences between major donors, confirming previous findings of Svensson (1999) and Alesina and Dollar (2000). The results also reveal that like-minded donors do not behave systematically different in this respect, which is in line with Neumayer (2003a). The mostly positive effect of democracy on the selection respectively the allocation decision confirm the general findings of Neumayer (2003b) but the donor countries are mostly different ones. In the same article, the UK and Canada are found to select a recipient with low corruption more likely, while our analysis shows the opposite effect for these two countries. Similar to his findings that the corruption level has basically no effect on allocation of foreign aid, corruption lowers the allocated development assistance in few cases in our study. Previous analyses found the behavior of other donors including multilateral donors to be a relevant factor for donor decisions (e.g. Berthélemy (2006), Younas (2008)) but to a varying degree (e.g. Hoeffler and Outram (2011)). However, as far as health assistance is concerned, these findings cannot be confirmed. The importance of bilateral relations for health assistance is in accordance with the literature on allocation of foreign aid. These similarities in the results suggest that the findings on the selection and allocation choices of bilateral donors are valid and not caused by the model specification.

## 8.4. Conclusion

The literature of empirical studies on aid allocation is abundant. Nevertheless, the peculiarities like the censored nature of the aid variable and the question, whether selection and allocation are related or independent, have penetrated the empirical research relatively recently. The available evidence suggests some key determinants for aid allocation decisions such as economic links or colonial past. Yet, most analyses focus on aggregate foreign aid provided by bilateral donors. Previous research has also revealed that bilateral donors pursue a multitude of objectives, but can sometimes be grouped according to similarities in their pattern. The available literature on the decision-making, understood as a two-step process, provides evidence that the driving forces of country selection and aid allocation can be, but need not be, the same.

Our study provides a detailed analysis of the determinants of the aid allocation decisions by the average donor, as well as by individual donors, with respect to health assistance. The analysis goes beyond previous research because, first, the aggregate analysis of average bilateral allocation decisions tests multiple hypotheses and, second, the disaggregate analysis at individual donor level provides a sector-specific analysis of the two-step decision-making process for health assistance. The analysis is guided by the question, to what extent health indicators are decisive when resources for the health sector are distributed. In addition, we control for several potential factors that may also influence the process, such as the quality of the institutional environment in the recipient country, the national expenditures for public health in the recipient country, competition among donors and bilateral relations between donor and recipient. We also test for the importance of the programmatic preferences of the donor in the aggregate analysis of the allocation behavior of the average donor. The dataset contains dyadic data on flows of health assistance from a maximum of 22 donors to a maximum of 160 recipients between 1990 and 2007.

The principal question of the previous analyses on the determinants of allocation is, to what extent recipient countries with poor health indicators are targeted particularly for health assistance. The estimation results for the allocation decision by the *average donor* reveal the differences between the health indicators. In the general estimations (Table 15), under-five mortality is not found to influence the allocation decision. Under-five mortality does neither increase nor decrease the attractiveness of a recipient country for a donor. Estimated separately, maternal mortality and HIV prevalence have a significantly positive effect on the allocation decision. On average, recipients with high maternal mortality or high HIV prevalence receive more health assistance. However, these effects change when all health indicators are included in the estimation simultaneously. Controlling for under-five mortality and maternal mortality, only HIV prevalence continues to have a positive effect on the allocation decision.

Restricting the sample to more recent years (Table 21) reveals a slightly different picture. Under-five mortality, maternal mortality and HIV prevalence influence the allocation decision. All three health indicators make the recipient country more attractive for donations of health assistance by the average donor. The effects of the indicators change, however, when estimated simultaneously. Under-five mortality and HIV prevalence continue to attract flows of health assistance, while maternal mortality decreases the receipt of such aid. As regards under-five mortality, it appears to have become another driving force of allocation decisions on health assistance in recent years. Yet, the relative effect is small compared to the importance of the other two health indicators.

Comparing the general results and the robustness check, the empirical evidence suggests that maternal mortality is irrelevant for the allocation decision, respectively lowers the receipt of health assistance. Based on the results of the separate estimations, however, it seems that the lost of significance, respectively the change in sign, in the joined estimations is owed to multicollinearity.[138] Therefore, we assume a neutral or, at most, positive effect of maternal mortality on the allocation decision of health assistance.

The estimation results on the *individual donor* behavior confirm this impression. As regards the simultaneous estimation of the three health indicators for the selection decision, under-five mortality increases the selection probability, but is only limitedly important, maternal mortality reduces the selection probability, and only HIV prevalence increases the selection chances in most cases. However, the robustness check shows that the maternal mortality does not reduce the attractiveness for selection, but increases it in selected cases. Regarding the estimation results for the allocation decision, health indicators are basically irrelevant for the allocation of health assistance. The robustness check confirms the empirical evidence because, with minor exceptions, the allocation decisions of major and like-minded donors are not based on health indicators.

In summary, maternal mortality and HIV prevalence increase the attractiveness for aid allocations of health assistance by the average donor, while under-five mortality does not matter for the average allocation decision. Focusing on more recent years, all health indicators are important for the provision of health assistance. Nevertheless, the HIV prevalence rate has the most consistent and most substantive effect on the average allocation decision. As regards the individual decision-making process, poor health indicators increase the selection probability but, again, HIV prevalence is the health indicator with the most consistent effect. Interestingly, basically none of the health indicators is relevant for the allocation decisions of individual donors, with few exceptions. Contrary to common

[138] Maternal mortality and HIV prevalence rate, respectively maternal mortality and under-five mortality, are imperfectly linearly related. On the one hand, higher maternal mortality is likely to be correlated with high prevalence of HIV because women are biologically more susceptible to this sexually transmitted infection (Skolnik (2008), 150). In fact, HIV/Aids is one of the three leading causes of female deaths in low-income countries (WHO (2009), 39). On the other hand, the under-five mortality rate is presumably correlated with the maternal mortality rate, because the importance of women as head of household and primary caregiver for children and the severe consequences of their illness or death is documented in many studies (e.g. WHO (2009), 3).

beliefs, the like-minded donors are not more strongly oriented at health indicators in their decision-making process than the major donors.

The quality of the institutional environment is important for the allocation decision by the average donor, as well as for many bilateral donors. Yet, the indicators of institutional quality affect the decision-making process of bilateral donors without any visible pattern. Expenditures for public health neither have a systematic effect on the allocation decision by the average donor, nor on the bilateral decision-making process. Strategic interactions influence the allocation decision of the average donor, with a relatively large budget for health assistance, but have no effect on the allocation decision of most individual donors. Donor characteristics, such as programmatic preferences, influence the average allocation decision. Bilateral relations, particularly economic, cultural and historic links, decisively influence the allocation behavior of the average donor. Also individual donors are strongly influenced by relational ties between donor and recipient in their decision-making process.

# PART V Conclusion

# Chapter 9
# Conclusion

## 9.1. Summary

In 2000, the United Nations' Millennium Development Goals (MDGs) set the reduction of child mortality, the improvement of maternal health and the fight of HIV/Aids, malaria and other diseases on the international development agenda. These objectives are more comprehensive, more concise and more specific as to the deadline in 2015. Not only increased the volume of resources devoted to health assistance substantially over the past two decades, but also the range of health objectives was enlarged. These developments suggest that the importance of health objectives has increased for, at least, traditional Western aid community.

Each year non-trivial amounts of health assistance are transferred from more developed countries to less developed countries. They typically are channeled by aid intermediaries, as the connecting links between donors and recipients. Aid intermediaries for health assistance are bilateral aid agencies, multilateral organizations, private foundations, public-private partnerships and international non-governmental organizations (NGOs). The first focal point of this doctoral thesis is to identify and to understand the dynamics inherent to the interactions between the multitude of donors and intermediaries.

The state-of-the-art approach in empirical aid literature is that political, economic, humanitarian and strategic motives provide a reasonable basis to explain the determinants of the decision-making process of foreign aid. Policy statements of many donors and intermediaries have emphasized the importance of global health problems. Bilateral aid agencies are the financially strongest and hence the most relevant intermediaries for health assistance. Consequently, the principal question of this doctoral thesis is, in how far the knowledge about poor health circumstances in a potential recipient country influences the decision-making process of aid intermediaries regarding health assistance. One secondary question is to what extent other motives possibly determine the selection of a country or the allocation of health assistance. Another secondary question is if the selectivity, according to health indicators, has increased after the identification of the MDGs.

The empirical analysis of this study is the first attempt to assess the importance of health indicators for the decision to select a recipient, and for the decision to allocate health assistance to a selected recipient. No prior evidence on the driving forces neither for the selection stage nor the allocation stage is available regarding health assistance. The explicit distinction between the selection decision and the allocation decision is necessary in order to enable the separate analysis of the two decisive steps in the decision-making process. The exclusive analysis of the second stage, the allocation decision, implies the assumption that the determinants of both stages are the same. The little available evidence for foreign aid on the differences between selection and allocation, however, suggests the

motives to be different. The second focal point of this thesis is to understand what drives the selection decision of the average bilateral aid agency as well as of individual bilateral aid agencies. The third focal point is to identify the determinants of the allocation decision of the average bilateral aid agency, but also of selected individual bilateral aid agencies. Dyadic data on flows of development assistance for health from a maximum of 22 donors to a maximum of 160 recipients between 1990 and 2007 have been used to answer the many questions. The dataset from the Institute for Health Metrics and Evaluation is based on the aid statistics on official development assistance (ODA) for the health sector, provided by the Development Assistance Committee (DAC) of the Organization for Economic Co-operation and Development (OECD).

## 9.2. Main conclusions

### 9.2.1. Donor-intermediary interactions

The allocation decision, as the visible part of the decision-making process for foreign aid, is modeled in three sequential games with two players, a donor and an intermediary. The abstraction from the complexities of the resource transfer in reality allows isolating the individual motives, the incentives for the strategic decisions of the players and consequences of the respective behavior in a general model. In this classic principal-agent setting with imperfect information, the donor always moves first; hence, the donor needs to trust in the reputation of the intermediary sufficiently to donate resources in the first place. The donor is expected to maximize utility through donating in the expectation of the largest possible positive impact, while the intermediary is expected to maximize funding in order to guarantee its organizational survival.

The three sequential games model the interaction between donor and intermediary under different circumstances. The game structure highlights the interdependencies between asymmetric information, trust, institutions and reputation. In each situation, the reputation mechanism has a different effect. The analysis reveals that the importance of reputation as feedback mechanism for the donor about the behavior of the intermediary is subject to the institutional setting and the relative power of each player. In the first game, the donor is trapped because there are no attractive outside options. The intermediary has a quasi-monopolistic status and the reputation mechanism fails. In the second game, the donor can credibly threaten with a financial cut, as the results of leaving the intermediary. However, as long as the donor is convinced of the intermediary's trustworthiness, the donor will not opt out. The game illustrates the interaction in a polypoly in which the reputation mechanism can work. In the third game, the donor is able to monitor the intermediary and thereby incentivizes the intermediary to focus on her preferences. The donor has a quasi-monopolistic status in this interaction situation. Reputation works now as direct feedback mechanism.

The modeling of the interaction between donor and recipient as a game has a closer look at the (broken) feedback loop between donors and recipients. The game modeling allows understanding of

the importance of reputation, how this mechanism is related to institutions, and under which conditions it is likely to work. The games also emphasize the importance of third parties as external sources of information in order to make reputation an effective mechanism. In their simplicity, the modeled interactions can be applied to the five types of intermediaries relevant for health assistance.

### 9.2.2. Country selection decisions

Previous studies on aid allocation with a separate analysis of the selection and the allocation decision are relatively scarce. Among the little available evidence, few analyses report or interpret their results for the selection stage. Our study provides a detailed analysis of the determinants of the country selection decisions by the average bilateral donor, as well as by individual bilateral donors with respect to the health sector, using a three-dimensional panel logit analysis, respectively panel probit analysis.[139] The importance of health and development indicators, the quality of the institutional environment in the receiving country, the recipient's efforts with respect to the national health system and the relational ties between donor and recipient are controlled for as potential underlying motives for the selection decision of health assistance. In addition, we test for the importance of strategic interaction among donors in the aggregate analysis of the selection behavior of the average donor. In total, ten hypotheses, classified in the above five categories, control for the potential determinants of the selection decision, allowing a detailed understanding of the driving factors.

Studying the effect of poor health indicators on the selection decision, the results of the aggregate analysis reveal that high under-five mortality and high HIV prevalence rates increase the selection probability. Maternal mortality, however, has an inconsistent effect on the selection decision, for a given level of child mortality and HIV prevalence. The results of the disaggregate analysis of individual donor behavior show that only the prevalence rate of HIV consistently increases the selection probability. The quality of the institutional environment is only of little importance for the selection decision by the average donor. Only economic freedom has a consistently positive effect on the selection probability, while the level of corruption, the rights and liberties or the effectiveness of the recipient's government is irrelevant. However, the available evidence for the individual donor behavior reveals that the significance and the magnitude of proxies for institutional quality vary across bilateral donors and among groups of bilateral donors. The investments in public health by the recipient have a very different effect on the selection probability by the average donor and by individual donors. Immunization rates are insignificant for the selection decision by the average bilateral donor, while they matter for the selection decisions of individual donors, but not substantially. Public health expenditures are insignificant for the average donor, while some bilateral donors give preference to recipients with high health expenditures and others select these countries

[139] Please remember that bilateral aid agencies are referred to as bilateral donors, following the tradition of the foreign aid literature, which facilitates comparisons of the empirical results to previous studies on foreign aid. In addition, it is only theoretically possible to distinguish between the national government as donor and the bilateral aid agency as intermediary, at least in cross-country analyses.

less likely. Economic, cultural and historic links influence the selection decision of the average bilateral donor, while economic, historic and geographic ties primarily drive the selection decision of individual donors. When selecting potential recipients, bilateral relations matter a lot for major donors, are less important for small donors and are basically irrelevant for like-minded donors. The relative importance of the donor matters for the selection decision taken by the average donor. The selection decision by the US, as most important donor, is particularly decisive for the selection decision of the average bilateral donor regarding populous recipient countries.

### 9.2.3. Aid allocation decisions

Although the literature of empirical studies on aid allocation is abundant, the peculiarities like the censored nature of the aid variable and the question, whether selection and allocation are related or independent, have penetrated the empirical research relatively recently. The available literature on the decision-making, understood as a two-step process, provides evidence that the driving forces of country selection and aid allocation can be, but need not be, the same.

Our study provides a detailed analysis of the determinants of the aid allocation decisions by the average donor, as well as by individual donors, with respect to health assistance, using a lognormal hurdle model. The analysis goes beyond previous research because, first, the aggregate analysis of average bilateral allocation decisions tests multiple hypotheses and, second, the disaggregate analysis at individual donor level provides a sector-specific analysis of the two-step decision-making process for health assistance.

The importance of health and development indicators, the quality of the institutional environment in the receiving country, the national expenditures for public health in the recipient country, competition among donors and bilateral relations between donor and recipient are controlled for as potential underlying motives for the selection decision of health assistance. In addition, we test for the importance of the programmatic preferences of the donor in the aggregate analysis of the allocation behavior of the average donor. In total, eleven hypotheses, grouped in the above six categories, control for the potential determinants of the allocation decision, allowing a detailed understanding of the driving factors.

The study of the importance of health indicators for the allocation process of health assistance provides the following picture: Maternal mortality and HIV prevalence increase the attractiveness for aid allocations of health assistance by the average donor, but under-five mortality does not matter for the average allocation decision. Focusing on more recent years, however, all health indicators are important for the provision of health assistance. Nevertheless, the HIV prevalence rate has the most consistent and substantive effect on the average allocation decision. As regards the individual decision-making process, poor health indicators increase the selection probability but, again, HIV prevalence is the health indicator with the most consistent effect. Interestingly, basically none of the health indicators is relevant for the allocation decisions of individual donors. Contrary to common

beliefs, the like-minded donors are not more strongly oriented at health indicators in their decision-making process than the major donors.

The quality of the institutional environment matters for the allocation decision by the average donor, as well as by many bilateral donors. The average bilateral donor allocates, ceteris paribus, more health assistance to recipients with greater economic freedom and less perceived corruption, but also to recipients with less rights and liberties. This suggests that the average donor seems to be aware of potential problems with corruption and to care about economic freedom, while less free countries receive more health assistance. One possible interpretation is that the average donor attempts to compensate for a bad government. Yet, the indicators of institutional quality affect the decision-making process of bilateral donors without any visible pattern. Expenditures for public health neither have a systematic effect on the allocation decision by the average donor, nor on the bilateral decision-making process. Strategic interactions influence the allocation decision of the average donor, with a relatively large budget for health assistance, but have no effect on the allocation decision of most individual donors. Bilateral relations, particularly economic, cultural and historic links, decisively influence the allocation behavior of the average donor. Also individual donors are strongly influenced by relational ties between donor and recipient in their decision-making process. Donor characteristics influence the average allocation decision. The donor's preference for health on the national political agenda seems to translate into higher allocation for health assistance, while more corruption in the donor country lowers the aid allocation. However, valid conclusions are difficult due to data availability. Controlling for per capita income of donor countries, more unequal donor societies provide consistently more assistance.

### 9.2.4. Selection and allocation decisions

The aggregate and disaggregate analyses of the decision-making process of intermediaries for health assistance highlight the importance of distinguishing between the selection decision and the allocation decision. Focusing on bilateral aid agencies as most important group of intermediaries, the analyses show that, first, under-five mortality and HIV prevalence rate lead to an increased selection probability by the average bilateral donor. Second, only the prevalence of HIV consistently increases the selection probability by individual bilateral donors. Third, maternal mortality and HIV prevalence increase the allocation of health assistance by the average bilateral donor. Fourth, all three health indicators have mattered increasingly in recent years for the decision-making process. Fifth, the allocation decisions of major and like-minded donors, as most important bilateral donors, are not based on health indicators, with minor exceptions.

In summary, the HIV prevalence rate is the health indicator with the most consistent effect on the selection decision of the average donor and of individual donors. In terms of the allocation decision, major and like-minded donors do not allocate health assistance based on health indicators. However, the behavior of the average donor shows that health indicators played a more important role in recent

years, with HIV prevalence being the most important and under-five mortality the least important indicator.

These results lead to the following conclusions: First, the effect of health indicators is different for the selection decision than for the allocation decision. This evidence is a strong argument to distinguish the two decision stages from each other. Second, health indicators have become a driving force for the allocation decision, at least of the average donor. It seems that the identification of three health objectives has caused a shift in the allocation policy. Despite the increased attention being paid to health circumstances, it needs also to be mentioned that, third, the HIV prevalence rate is the indicator with the most consistent and the relative greatest effect. HIV/Aids seems to be the global health problem which attracts most attention by the traditional donor community, controlling for under-five mortality and maternal mortality. On the one hand, this result simply means that the HIV prevalence rate is the only health indicator whose role in the decision-making process is uniquely identified, but not that it is really the only health indicators which matters. On the other hand, given the unique and consistent importance of HIV/Aids, one could assume that the greater media coverage of the HIV/Aids pandemics in Western media has caused a crowding-out effect. Fourth, the evidence refutes the myth about like-minded donors being more or exclusively focused on recipient need in their decisions. Fifth, even sector-specific aid such as health assistance is subject to many other aspects of recipient characteristics, donor characteristics as well as bilateral relations between donor and recipient.

Putting the results into perspective, this means that health indicators affect the selection and allocation decision, but to a different degree. The internationally established health objectives guide the aid policies of donors heterogeneously. Overall, many motives, including political and economic factors, drive the selection and allocation policies of the average donor as well as for the majority of bilateral donors, although health assistance is specifically meant for the sector health. In summary, the decision-making process for health assistance of the average donor and of individual donors is multidimensional, rather than narrowly focused on recipient need as expressed by poor health indicators.

## 9.3. Limitations

At the beginning, the changed organizational landscape of foreign aid in general and of health assistance in specific has been emphasized. Five aid intermediary have been identified which shape the environment in which decision on health assistance take place. As the intermediaries are a heterogeneous group of governmental and non-governmental, established and rather young organizations, a comparative analysis of the driving forces of the respective decision-making process would have been a promising avenue to identify similarities and differences. However, due to data availability, such a comparative analysis could not be realized. IHME provides two datasets, which

cannot be combined: One provides information on the resource flow between aid intermediary and recipient, while the other contains information on the resource flow between donor and aid intermediary. Multilateral organizations, represented in the first dataset used for our analyses, comprise the World Bank, the Asian Development Bank, the Inter-American Development Bank and the European Commission; hence, major funders of health assistance such as the WHO, the UN Children's Fund (UNICEF), the UN Population Fund (UNFPA) or the Joint UN Programme on HIV/AIDS (UNAIDS), but also the African Development Bank are missing. The global health funds the Global Fund and the GAVI Alliance are represented, while the Bill and Melinda Gates Foundation is the only private foundation represented in the dataset, which is also the financier of the IHME project. Since project-level information for the US NGOs is not available, according to the IHME, they are not included in any dataset. In addition, data on NGOs or private foundations not registered in the US are hard to find and, therefore, are not included in any dataset. In other words, data on some of the financially most important intermediaries WHO, UNICEF, UNFPA and the NGOs, as summarized in IHME (2009), 94-95, are not included in the dataset on the flows of health assistance from intermediary to recipient. Concluding, the available data did not appear comprehensive enough to allow for a sound comparative analysis of the differences and similarities with respect to the intermediaries' motives of their decision-making process.

## 9.4. Last remarks

The results of the detailed analyses of the decision-making process for health assistance show that many factors, to a varying degree, determine the selection of a country as aid recipient as well as the allocation of aid to a selected recipient. Future studies will need to take into account two aspects, under the condition that a dataset provides sufficient observations. First, the determinants of the selection and the allocation decision are likely to be different and, second, most probably numerous aspects determine these two decisions. This study has suggested a non-normative classification of potential determinants into donor characteristics, recipient characteristics, and bilateral relations between donor and recipient.

The health indicators used in our analyses reflect the degree to which the local population suffers from maternal mortality, under-five mortality or HIV/Aids. They reflect the actual need with respect to a specific health problem as well as, indirectly, the inability of the recipient country's government to provide sufficient basic health care services to its population. This doctoral thesis analyzes the donor-intermediary interaction in the theoretical part and the decision-making process of intermediaries for development assistance for health in the empirical part. The focus on the first links of the aid chain is adequate to analyze the determinants of the decision-making process. As a consequence, the recipient, respectively the intended beneficiary, is excluded. When thinking about the effectiveness of aid interventions, it needs to be taken into consideration that a resource transfer in form of health

assistance from donor to recipient has two effects. The direct effect is that the transfer helps to alleviate immediate needs, under the assumption that the resources are efficiently and effectively used. The indirect effect is that the transfer is likely to change the incentive structure of the recipient such that the national government has little or no motivation to change the status quo. In other words, all other things being equal, the government will extend little effort to improve the health conditions of its population by own means. If the donor, however, conditions future transfers on, for example, a falling rate of maternal mortality, the government would have an incentive to get involved in complementary efforts. Then, the transfer would become a reward for signs of improvement, while cutting down or stopping funding would become a punishment for a lack of improvement. Since the possible problems related to conditional aid are well-documented in the literature, it is by no means a panacea. In order to anticipate problems, it is recommended to design policies on granting development assistance such that they take into consideration the existing institutional setting and how these resource flows interfere with and, hence, change the incentive structure of the players. In addition, short-term resource transfers can alleviate immediate needs, but are unlikely to substantially change the conditions in the long-run. Therefore, the resource transfer of health assistance to alleviate current needs must be complemented by other efforts such as educational campaigns or infrastructure in order to achieve an improvement in the long-run.

The MDGs represent eight objectives, which the international community identified as priorities for the development agenda in the year 2000. For the next fifteen years, these objectives represent a guideline, or even a norm, about the necessary to be done. The importance of health as a human right, clashing with the precarious health circumstances of many people around the world, determines the public discourse on the reason for these three health objectives. The motives for selecting a country as recipient, but also for allocating a specific amount of health assistance, are meticulously studied and made transparent in this doctoral thesis. The comprehension of these motives, underlying the decision-making process, is a prerequisite to judge the effectiveness of these aid flows. Only transparency about the determinants of selection and allocation decisions for health assistance allows for a critical evaluation of the achievements in the future.

# Appendices

## Appendix A Overview of the sample of recipients

| | | | |
|---|---|---|---|
| Afghanistan | Dominican Republic* | Marshall Is.* | Solomon Is.* |
| *Albania°* | *Ecuador* | *Mauritania* | Somalia |
| *Algeria* | *Egypt* | *Mauritius** | *South Africa* |
| *Angola* | *El Salvador* | Mayotte | *South Korea* |
| Anguilla* | Equatorial Guinea | *Mexico* | *Sri Lanka* |
| Antigua & Barbuda* | Eritrea | Micronesia* | St. Helena |
| *Argentina* | *Ethiopia* | *Moldova°* | St. Kitts & Nevis* |
| *Armenia°* | *Fiji** | *Mongolia* | St. Lucia* |
| *Azerbaijan°* | *Gabon* | Montenegro° | St. Vincent & the Grenadines* |
| *Bahrain* | *Georgia* | Montserrat* | Sudan |
| *Bangladesh* | *Ghana* | *Morocco* | Suriname* |
| Barbados* | Grenada* | *Mozambique* | Swaziland |
| Belarus° | *Guatemala* | Myanmar | *Syria* |
| Belize* | Guinea | *Namibia* | Tajikistan° |
| *Benin* | Guinea-Bissau* | Nauru* | *Tanzania* |
| Bhutan | *Guyana** | *Nepal* | *Thailand* |
| *Bolivia* | *Haiti** | Netherlands Antilles* | The Gambia |
| Bosnia & Herzegovina° | *Honduras* | *Nicaragua* | Timor-Leste* |
| *Botswana* | *India* | *Niger* | *Togo* |
| *Brazil* | *Indonesia* | *Nigeria* | Tokelau |
| *Burkina Faso* | *Iran* | Niue* | Tonga* |
| *Burundi* | Iraq | North Korea | *Trinidad & Tobago** |
| Cambodia | *Jamaica** | Northern Mariana Is.* | *Tunisia* |
| *Cameroon* | *Jordan* | *Oman* | *Turkey* |
| Cape Verde* | *Kazakhstan°* | *Pakistan* | Turkmenistan° |
| *Central African Republic* | *Kenya* | Palau* | Turks & Caicos Is. |
| *Chad* | Kiribati* | Palestinian Territory | Tuvalu* |
| *Chile* | *Kyrgyzstan°* | *Panama* | *Uganda* |
| *China* | Laos | *Papua New Guinea** | *Ukraine°* |
| *Colombia* | Lebanon | *Paraguay* | *Uruguay* |
| Comoros* | *Lesotho* | *Peru* | Uzbekistan° |
| *Congo* | Liberia | *Philippines* | Vanuatu* |
| *Congo, DRC* | Libya | *Rwanda* | *Venezuela* |
| Cook Is.* | *Macedonia°* | Samoa* | *Vietnam* |
| *Costa Rica* | *Madagascar* | Sao Tome & Principe* | Wallis & Futuna |
| *Cote d'Ivoire* | *Malawi* | Saudi Arabia | Yemen |
| *Croatia°* | *Malaysia* | *Senegal* | *Zambia* |
| Cuba* | Maldives* | Serbia° | *Zimbabwe* |
| Djibouti | *Mali* | Seychelles* | |
| Dominica* | Malta | *Sierra Leone* | |

Notes: 1. Countries in italics are part of the core sample of the regressions for selection by the average donor respectively for allocation by the average donor (Please note that Bahrain is only part of the core sample as regards the selection decision.) 2. * denotes small island developing states following the UN definition (http://unstats.un.org/unsd/methods/m49/m49regin.htm). 3. ° denotes transitions countries following the UN definition. (http://unstats.un.org/unsd/methods/m49/m49regin.htm#transition). 4. Yugoslavia is excluded to avoid double entries, Gibraltar as high-income country is excluded. 5. De facto dependencies: *France*: Mayotte, New Caledonia, Wallis & Futuna; *Netherlands*: Netherlands Antilles; *New Zealand*: Cook Is., Niue, Tokelau; *UK*: Anguilla, Falkland Is., Montserrat, St. Helena, Turks & Caicos Is.; *US*: Northern Mariana Is., Palau.

## Appendix B Definition and sources of variables

| Variable | Variable name | Definition | Source | Expected sign |
|---|---|---|---|---|
| **Dependent variable (selection)** | | | | |
| $DAH_{ijt}$ | DAH | Dummy (0 = no, 1 = country *i* received DAH from donor *j* in year *t*) | Ravishankar et al. (2009) | |
| $DAH^{*}_{ijt}$ | DAH (latent) | | Ravishankar et al. (2009) | |
| **Dependent variable (allocation)** | | | | |
| ln $DAH_{ijt}$ | DAH | (Logged) DAH for recipient *i* by donor *j* in year *t* (US$) | Ravishankar et al. (2009) | |
| **Health indicators** | | | | |
| $M_{i,t-1}$ | Under five mortality | Probability of dying by age 5 per 1,000 live births in country *i* in year *t-1* (in ‰) | Rajaratnam et al. (2010) | + |
| $Mm_{i,t-1}$ | Maternal mortality | Annual number of female deaths during pregnancy, childbirth or within 42 days after per 1,000 live births in country *i* in year *t-1* (in ‰) | Hogan et al. (2010) | + |
| $HIV_{i,t-1}$ | Prevalence of HIV | Prevalence of HIV (% of population ages 15-49) in country *i* in year *t-1* | World Bank (2010) | + |
| **Development indicators** | | | | |
| $\mathbf{ln}\, \boldsymbol{Pop_{i,t-1}}$ | Population | (Logged) Population in country *i* in year *t-1* | UN Statistics Division (2010); World Bank (2010); CIA (2010) | - |
| $\mathbf{ln}\, \boldsymbol{Y_{i,t-1}}$ | GDP p.c. | (Logged) Per capita income in country *i* in year *t-1* | World Bank (2010) | - |
| $HDI_{i,t-1}$ | HDI | Human Development Index in country *i* in year *t-1* (in %) | UNDP (2010b) | - |
| **Institutional quality indicators** | | | | |
| $\boldsymbol{Dem_{i,t-1}}$ | Democracy | An index on a scale of -10 (strongly autocratic) to +10 (strongly democratic) of country *i* in year *t-1* | Marshall et al. (2010) | + |
| $RL_{i,t-1}$ | Rights and liberties | Measured on a scale from 1 to 7, with 7 reflecting the highest degree of rights and liberties; of country *i* in year *t-1* | Freedom House (2009) | + |
| $Free_{i,t-1}$ | Economic freedom | Measured on a 0 to 10 scale, with 10 representing the greatest degree of freedom; of country *i* in year *t-1* | Gwartney and Lawson (2009) | + |
| $IEF_{i,t-1}$ | Index of economic freedom | Measured on a 0 to 100 scale, with higher values representing the greatest degree of freedom; of country *i* in year *t-1* | Miller et al. (2011) | + |
| $GovEff_{i,t-1}$ | Government effectiveness | Government Effectiveness ranges from -2.5 to 2.5, with higher values indicating higher government effectiveness; of country *i* in year *t-1* | Kaufmann et al. (2009) | + |

*(continued)*

| Variable | Variable name | Definition | Source | Expected sign |
|---|---|---|---|---|
| $CPI_{i,t-1}$ | CPI | Corruption Perceptions Index ranges from 1 to 10, with higher values indicating higher levels of corruption; of country *i* in year *t-1* | Transparency International (2010) | - |
| $Corr_{i,t-1}$ | Corruption | Corruption ranges from -2.5 to 2.5, with higher values representing more corruption; of country *i* in year *t-1* | Kaufmann et al. (2009) | - |
| **Effort indicators** | | | | |
| $Exp_{i,t-1}$ | Public expenditure on health | Government health spending in country *i* in year *t-1* (% of GDP) | Lu et al. (2010) | + |
| $Immun_{i,t-1}$ | Immunization rates | Coverage of DTP3 (third dose of diphtheria toxoid, tetanus toxoid and pertussis vaccine) in country *i* in year *t-1* (in %) | WHO (2011) | + |
| **Rivalry indicators** | | | | |
| $Choice_{t-1}$ | US choice | Dummy (0 = no, 1= selection by the US of recipient *i* in year *t-1*) | Ravishankar et al. (2009) | ? |
| $USaid_{i,t-1}$ | US aid | (Logged) US aid recipient *i* in year *t-1* (US$) | Ravishankar et al. (2009) | ? |
| $Donor_{j,t-1}$ | Donor size | Dummy (0 = Budget share ≤ 5% of donor *j* of total DAH budget in year *t-1*, 1= > 5%) | Ravishankar et al. (2009) | ? |
| $\ln DAH_{ij,t-1}$ | Previous allocation | (Logged) DAH for recipient *i* by donor *j* in year *t-1* (US$) | Ravishankar et al. (2009) | + |
| $\ln \sum_{j^*}^{7} DAH_{i,t-1}$ | Multilateral aid | (Logged) Total DAH that recipient *i* received from multilateral donors *j** in year *t-1* (in US$) | Ravishankar et al. (2009) | ? |
| **Indicator for programmatic preferences** | | | | |
| $Public_{j,t-1}$ | Public health expenditures | Government health spending by donor *j* in year *t-1* (% of GDP) | Eurostat (2011) | + |
| $TransCPI_{j,t-1}$ | Political transparency (CPI) | Corruption Perceptions Index ranges from 1 to 10, with higher values indicating more political transparency of donor *j* in year *t-1* | Transparency International (2010) | + |
| $TransCorr_{j,t-1}$ | Political transparency (Corruption) | Corruption ranges from -2.5 to 2.5, with higher values representing more political transparency; of country *i* in year *t-1* | Kaufmann et al. (2009) | + |
| $Gini_{i,t-1}$ | Gini index | Gini coefficient in country *i* in year *t-1*, with higher values indicating greater inequality | UNU-WIDER (2008) | - |
| **Relationship indicators** | | | | |
| $\ln Ex_{ij,t-1}$ | Exports | (Logged) Total exports from donor *j* to recipient *i* in year *t-1* | Barbieri et al. (2008) | + |
| $\ln Im_{ij,t-1}$ | Imports | (Logged) Total imports of donor *j* from recipient *i* in year *t-1* | Barbieri et al. (2008) | + |
| $\ln Trade_{ij,t-1}$ | Trade volume | (Logged) Total trade (sum of exports and imports) between donor *j* and recipient *i* in year *t-1* | Barbieri et al. (2008) | + |

*(continued)*

| Variable | Variable name | Definition | Source | Expected sign |
|---|---|---|---|---|
| $Pol_{i,t-1}$ | Political integration | Degree of political globalization of country *i* in year *t-1* (in %) | Dreher (2006) | + |
| $Color_{ij,t-1}$ | Political proximity | Dummy (0 = no, 1 = chief executive's party orientation (right, left, center) is the same in year *t-1*) | Beck et al. (2001) | + |
| $Lang_{ij}$ | Language | Dummy (0 = no, 1 = dominant language in donor and recipient country is the same) | CEPII (2010); CIA (2010); Haveman (2010) | + |
| $Rel_{ij}$ | Religion | Dummy (0 = no, 1 = dominant religion in donor and recipient country is the same) | CIA (2010) | + |
| $Social_{i,t-1}$ | Social integration | Degree of social globalization of country *i* in year *t-1* (in %) | Dreher (2006) | + |
| $\mathbf{\ln Col_i}$ | Colonial history | (Logged) Number of years since 1900 in which country *i* was a colony | Correlates of War 2 Project (2006) | ? |
| $\ln Col_{ij}$ | Own colony | (Logged) Number of years since 1900 in which country *i* was a colony of donor *j* | Correlates of War 2 Project (2006) | + |
| $\ln ColOth_{ij*}$ | Other colony | (Logged) Number of years since 1900 in which country *i* was a colony of other *(j*≠j)* | Correlates of War 2 Project (2006) | - |
| $\mathbf{\ln Dist_{ij}}$ | Bilateral distance | (Logged) Geodesic (great circle) distance between donor's and recipient's capitals | CEPII (2010); Byers (1997); CIA (2010) | - |
| $Continent_i$ | Continent | Dummy (0 = no, 1 = country *i* part of Africa, America, Asia, Europe or Oceania) | CIA (2010) | ? |

Note: Standard control variables in bold.

# Appendix C Descriptive statistics

## C.1. Selection and allocation decisions, average donor

| Variable | Obser-vations | Mean | Median | Minimum | Maximum | Standard deviation |
|---|---|---|---|---|---|---|
| Year° | 63,360 | 1998.5 | 1998.5 | 1990 | 2007 | 5.19 |
| Health aid° | 63,360 | 566,454 | 0 | -495,467 | 411,000,000 | 3,961,667 |
| (ln) Health assistance° | 13,347 | 12.90 | 13.03 | -1.85 | 19.83 | 2.26 |
| Population | 59,818 | 29,400,000 | 4,795,088 | 1,405 | 1,300,000,000 | 125,000,000 |
| (ln) Population | 59,818 | 14.84 | 15.38 | 7.25 | 20.99 | 2.64 |
| GDPpc | 50,798 | 2,068 | 1,019 | 69 | 18,800 | 2,620 |
| (ln) GDPpc | 50,798 | 6.98 | 6.93 | 4.24 | 9.84 | 1.17 |
| Under-five mortaliy | 53,438 | 74.5 | 52.5 | 5.5 | 301.5 | 59.0 |
| Maternal mortality | 51,612 | 3.5 | 1.6 | 0.1 | 21.1 | 3.8 |
| HIV prevalence | 34,144 | 2.3 | 0.5 | 0.0 | 28.9 | 4.9 |
| HDI | 44,858 | 58.1 | 62.2 | 4.5 | 94.5 | 20.6 |
| Democracy | 43,362 | 0.6 | 1.0 | -10.0 | 10.0 | 6.5 |
| Rights and liberties | 52,294 | 3.9 | 4.0 | 1.0 | 7.0 | 1.9 |
| Economic freedom | 30,206 | 5.7 | 5.8 | 2.3 | 8.0 | 1.0 |
| Index of Economic Freedom | 26,004 | 54.8 | 56.3 | 8.0 | 77.8 | 11.2 |
| Government effectiveness | 30,096 | -0.5 | -0.5 | -2.4 | 1.5 | 0.7 |
| CPI | 15,224 | 3.6 | 3.1 | 0.4 | 10.0 | 1.8 |
| Control of corruption | 21,340 | 0 | 0 | -2 | 2 | 1 |
| Health expenditures (%) | 27,346 | 1.97 | 1.79 | 0.00 | 6.40 | 1.08 |
| Immunization rates | 53,988 | 78 | 85 | 6 | 99 | 21 |
| US choice | 59,840 | 0.49 | 0 | 0 | 1 | 0.50 |
| US aid | 56,320 | 4,555,757 | 0 | 0 | 411,000,000 | 13,100,000 |
| (ln) US aid | 25,542 | 14.96 | 15.43 | 3.76 | 19.83 | 1.96 |
| Annual budget | 59,840 | 81,600,000 | 31,000,000 | 0 | 2,060,000,000 | 187,000,000 |
| Donor size | 56,320 | 0.25 | 0.00 | 0.00 | 1.00 | 0.43 |
| Multilateral aid | 53,108 | 10,200,000 | 868,168 | -2,609 | 352,000,000 | 31,100,000 |
| (ln) Multilateral aid | 35,398 | 14.83 | 15.37 | 5.58 | 19.68 | 2.36 |
| Health expenditures, donor | 8,320 | 9 | 9 | 7 | 15 | 2 |
| Political transparency (CPI) | 38,400 | 7.82 | 8.35 | 2.99 | 10.00 | 1.51 |
| Political transparency | 24,640 | 2 | 2 | 0 | 2 | 0 |
| Gini, donor | 46,880 | 31.24 | 31.00 | 23.00 | 46.40 | 4.55 |
| Exports | 33,875 | 267,000,000 | 8,910,000 | 0 | 140,000,000,000 | 2,460,000,000 |
| (ln) Exports | 32,689 | 16.03 | 16.13 | 7.01 | 25.67 | 2.85 |
| Imports | 33,869 | 360,000,000 | 4,400,000 | 0 | 270,000,000,000 | 3,780,000,000 |
| (ln) Imports | 29,889 | 15.76 | 15.84 | 6.31 | 26.32 | 3.20 |
| Trade | 33,846 | 627,000,000 | 17,500,000 | 0 | 336,000,000,000 | 6,020,000,000 |
| (ln) Trade | 32,995 | 16.71 | 16.77 | 7.01 | 26.54 | 2.92 |
| Political integration | 55,638 | 47.66 | 45.33 | 1.00 | 93.64 | 22.39 |
| Political proximity | 43,974 | 0.21 | 0 | 0 | 1 | 0.41 |
| Common language | 59,840 | 0.15 | 0 | 0 | 1 | 0.36 |
| Common religion | 59,840 | 0.57 | 1 | 0 | 1 | 0.49 |
| Social integration | 54,142 | 34.54 | 33.14 | 2.83 | 75.60 | 15.59 |

*(continued)*

| Variable | Observations | Mean | Median | Minimum | Maximum | Standard deviation |
|---|---|---|---|---|---|---|
| Colonial history | 63,360 | 33.59 | 38 | 0 | 93 | 31.03 |
| (ln) Colonial history | 63,360 | 2.40 | 3.63 | 0 | 4.53 | 1.93 |
| Own colony | 63,360 | 1.56 | 0 | 0 | 93 | 9.65 |
| (ln) Own colony | 63,360 | 0.11 | 0.00 | 0 | 4.53 | 0.66 |
| Other colony | 63,360 | 31.69 | 16 | 0 | 93 | 30.98 |
| (ln) Other colony | 63,360 | 2.27 | 2.77 | 0 | 4.53 | 1.95 |
| Distance | 63,360 | 8,128 | 7,741 | 271 | 18,953 | 4,082 |
| (ln) Distance | 63,360 | 8.84 | 8.95 | 5.60 | 9.85 | 0.62 |
| Aid | 59,840 | 526,203 | 0 | -115,032 | 411,000,000 | 3,498,175 |
| (ln) Aid | 12,223 | 12.92 | 13.05 | -1.85 | 19.83 | 2.22 |

Note: Data for regressors marked with ° are for the years 1990 till 2007. All other time-varying data is lagged by one year. The natural logarithm ln(x) is used for logged values.

## C.2. Allocation decisions of major donors

| France | | | | | |
|---|---|---|---|---|---|
| Variable | Obs. | Mean | Minimum | Maximum | Std. Dev. |
| Health aid° | 1,203 | 1,422,587 | 0.16 | 45,900,000 | 3,438,127 |
| Population | 1,203 | 49,900,000 | 15,283 | 1,300,000,000 | 174,000,000 |
| GDPpc | 1,156 | 1,628 | 85 | 10,453 | 1,926 |
| Under-five mortality | 1,191 | 86.7 | 6.0 | 301.5 | 64.8 |
| Maternal mortality | 1,169 | 4.1 | 0.1 | 21.1 | 3.9 |
| HIV prevalence | 846 | 2.5 | 0.0 | 28.9 | 4.8 |
| HDI | 1,098 | 54.6 | 4.5 | 93.1 | 20.5 |
| Democracy | 1,065 | 0.8 | -10.0 | 10.0 | 6.2 |
| Rights and liberties | 1,169 | 3.9 | 1.0 | 7.0 | 1.7 |
| Economic freedom | 803 | 5.7 | 2.9 | 8.0 | 1.0 |
| CPI | 485 | 3.7 | 0.4 | 10.0 | 1.8 |
| Health expenditure | 801 | 1.8 | 0.0 | 4.9 | 1.0 |
| Immunization | 1,178 | 74.3 | 6.0 | 99.0 | 22.2 |
| US aid | 1,156 | 6,818,025 | 0 | 104,000,000 | 13,000,000 |
| Multilateral aid | 1,182 | 16,500,000 | -2,168 | 352,000,000 | 40,700,000 |
| Exports | 938 | 447,000,000 | 1,100,000 | 12,600,000,000 | 1,020,000,000 |
| Political integration | 1,197 | 56 | 1 | 94 | 20 |
| Social integration | 1,187 | 32.31 | 4.68 | 75.44 | 15.33 |
| Own colony | 1,203 | 16 | 0 | 77 | 26 |
| Other colony | 1,203 | 20 | 0 | 81 | 29 |
| Distance | 1,203 | 6,573 | 1,082 | 16,595 | 2,855 |
| Aid | 1,203 | 1,372,296 | 0 | 45,900,000 | 3,437,858 |

| Germany | | | | | |
|---|---|---|---|---|---|
| Variable | Obs. | Mean | Minimum | Maximum | Std. Dev. |
| Health aid° | 772 | 2,539,697 | 791 | 54,400,000 | 4,822,694 |
| Population | 772 | 58,800,000 | 438,971 | 1,300,000,000 | 180,000,000 |
| GDPpc | 754 | 1,054 | 85 | 8,216 | 1,255 |
| Under-five mortality | 772 | 90.1 | 5.5 | 247.2 | 56.5 |
| Maternal mortality | 772 | 4.6 | 0.1 | 20.5 | 4.0 |
| HIV prevalence | 615 | 3.2 | 0.0 | 27.3 | 5.3 |
| HDI | 733 | 53.3 | 7.4 | 93.1 | 17.4 |
| Democracy | 748 | 1.5 | -10.0 | 10.0 | 6.1 |
| Rights and liberties | 754 | 4.1 | 1.0 | 7.0 | 1.6 |
| Economic freedom | 563 | 5.8 | 2.9 | 8.0 | 0.9 |
| CPI | 440 | 3.4 | 0.4 | 10.0 | 1.8 |
| Health expenditure | 607 | 1.7 | 0.0 | 5.1 | 1.0 |
| Immunization | 766 | 76.4 | 18.0 | 99.0 | 19.9 |
| US aid | 759 | 10,300,000 | 0 | 104,000,000 | 14,700,000 |
| Multilateral aid | 772 | 23,100,000 | 0 | 352,000,000 | 48,000,000 |
| Exports | 595 | 640,000,000 | 910,000 | 35,900,000,000 | 2,850,000,000 |
| Political integration | 772 | 59 | 8 | 93 | 19 |
| Social integration | 770 | 30.54 | 2.83 | 68.14 | 13.14 |
| Own colony | 772 | 2 | 0 | 16 | 5 |
| Other colony | 772 | 27 | 0 | 75 | 29 |
| Distance | 772 | 6,748 | 772 | 13,696 | 2,608 |
| Aid | 772 | 2,209,092 | 0 | 54,400,000 | 4,524,361 |

| Japan | | | | | |
|---|---|---|---|---|---|
| Variable | Obs. | Mean | Minimum | Maximum | Std. Dev. |
| Health aid° | 922 | 3,951,923 | 838 | 91,900,000 | 7,010,278 |
| Population | 922 | 54,300,000 | 9,245 | 1,300,000,000 | 185,000,000 |
| GDPpc | 895 | 1,482 | 86 | 11,180 | 1,723 |
| Under-five mortality | 908 | 72.2 | 5.5 | 301.5 | 52.6 |
| Maternal mortality | 885 | 3.6 | 0.1 | 21.1 | 3.6 |
| HIV prevalence | 624 | 2.8 | 0.0 | 28.9 | 5.6 |
| HDI | 818 | 58.6 | 4.8 | 90.3 | 17.4 |
| Democracy | 800 | 1.4 | -10.0 | 10.0 | 6.2 |
| Rights and liberties | 895 | 4.1 | 1.0 | 7.0 | 1.7 |
| Economic freedom | 586 | 5.9 | 2.3 | 8.0 | 0.9 |
| CPI | 471 | 3.4 | 0.4 | 10.0 | 1.7 |
| Health expenditure | 644 | 1.9 | 0.0 | 6.4 | 1.1 |
| Immunization | 909 | 80.6 | 13.0 | 99.0 | 17.6 |
| US aid | 879 | 9,220,130 | 0 | 411,000,000 | 19,800,000 |
| Multilateral aid | 908 | 17,500,000 | -2,609 | 344,000,000 | 39,100,000 |
| Exports | 216 | 2,760,000,000 | 150,000 | 26,000,000,000 | 4,990,000,000 |
| Political integration | 914 | 55 | 8 | 93 | 21 |
| Social integration | 910 | 34.11 | 2.83 | 75.44 | 14.20 |
| Own colony | 922 | 0 | 0 | 35 | 2 |
| Other colony | 922 | 30 | 0 | 91 | 29 |
| Distance | 922 | 10,000 | 1,157 | 18,587 | 4,015 |
| Aid | 922 | 2,975,407 | 0 | 91,900,000 | 5,984,632 |

| Spain | | | | | |
|---|---|---|---|---|---|
| Variable | Obs. | Mean | Minimum | Maximum | Std. Dev. |
| Health aid° | 572 | 2,439,070 | 3,222 | 41,800,000 | 4,741,146 |
| Population | 572 | 57,900,000 | 140,131 | 1,300,000,000 | 192,000,000 |
| GDPpc | 561 | 1,642 | 85 | 13,497 | 1,802 |
| Under-five mortality | 572 | 77.3 | 5.5 | 291.8 | 58.9 |
| Maternal mortality | 572 | 4.0 | 0.1 | 20.5 | 4.2 |
| HIV prevalence | 467 | 2.6 | 0.0 | 28.9 | 4.5 |
| HDI | 538 | 59.0 | 7.9 | 89.3 | 17.4 |
| Democracy | 531 | 2.5 | -9.0 | 10.0 | 5.7 |
| Rights and liberties | 556 | 3.9 | 1.0 | 7.0 | 1.6 |
| Economic freedom | 436 | 6.0 | 2.9 | 8.0 | 0.9 |
| CPI | 381 | 3.6 | 1.2 | 9.0 | 1.8 |
| Health expenditure | 502 | 2.0 | 0.0 | 5.5 | 1.1 |
| Immunization | 562 | 77.6 | 6.0 | 99.0 | 20.1 |
| US aid | 571 | 10,900,000 | 0 | 411,000,000 | 22,800,000 |
| Multilateral aid | 572 | 27,200,000 | 0 | 352,000,000 | 52,500,000 |
| Exports | 360 | 146,000,000 | 150,000 | 2,720,000,000 | 358,000,000 |
| Political integration | 572 | 63 | 8 | 94 | 18 |
| Social integration | 572 | 35.19 | 5.90 | 75.01 | 13.86 |
| Own colony | 572 | 1 | 0 | 60 | 7 |
| Other colony | 572 | 25 | 0 | 77 | 29 |
| Distance | 572 | 6,410 | 707 | 15,549 | 2,829 |
| Aid | 572 | 2,031,235 | 0 | 41,800,000 | 4,407,174 |

| UK | | | | | |
|---|---|---|---|---|---|
| Variable | Obs. | Mean | Minimum | Maximum | Std. Dev. |
| Health aid° | 883 | 4,187,514 | 1,725 | 161,000,000 | 10,300,000 |
| Population | 883 | 61,200,000 | 6,409 | 1,300,000,000 | 195,000,000 |
| GDPpc | 802 | 1,074 | 93 | 8,638 | 1,346 |
| Under-five mortality | 829 | 91.6 | 5.5 | 286.1 | 58.5 |
| Maternal mortality | 810 | 4.3 | 0.1 | 20.0 | 3.6 |
| HIV prevalence | 622 | 3.6 | 0.0 | 28.9 | 6.2 |
| HDI | 763 | 51.7 | 4.8 | 89.5 | 18.9 |
| Democracy | 773 | 1.5 | -9.0 | 10.0 | 5.8 |
| Rights and liberties | 801 | 4.0 | 1.0 | 7.0 | 1.6 |
| Economic freedom | 547 | 5.6 | 2.9 | 7.5 | 1.0 |
| CPI | 328 | 3.3 | 0.4 | 10.0 | 1.7 |
| Health expenditure | 531 | 1.7 | 0.0 | 5.1 | 1.0 |
| Immunization | 817 | 74.9 | 12.0 | 99.0 | 20.9 |
| US aid | 867 | 8,804,715 | 0 | 104,000,000 | 13,800,000 |
| Multilateral aid | 829 | 20,300,000 | -2,609 | 352,000,000 | 45,700,000 |
| Exports | 664 | 355,000,000 | 0 | 11,200,000,000 | 1,020,000,000 |
| Political integration | 829 | 55 | 8 | 92 | 20 |
| Social integration | 829 | 29.10 | 4.52 | 68.63 | 13.16 |
| Own colony | 883 | 24 | 0 | 91 | 31 |
| Other colony | 883 | 10 | 0 | 75 | 21 |
| Distance | 883 | 7,371 | 1,341 | 16,318 | 2,728 |
| Aid | 883 | 3,507,246 | 0 | 161,000,000 | 9,209,894 |

| US | | | | | |
|---|---|---|---|---|---|
| Variable | Obs. | Mean | Minimum | Maximum | Std. Dev. |
| Health aid° | 1,256 | 11,000,000 | 43 | 411,000,000 | 21,100,000 |
| Population | 1,256 | 42,100,000 | 9,536 | 1,300,000,000 | 140,000,000 |
| GDPpc | 1,211 | 1,188 | 82 | 13,497 | 1,401 |
| Under-five mortality | 1,244 | 91.9 | 5.5 | 301.5 | 61.6 |
| Maternal mortality | 1,237 | 4.3 | 0.1 | 21.1 | 4.0 |
| HIV prevalence | 967 | 2.9 | 0.0 | 28.9 | 5.4 |
| HDI | 1,113 | 52.6 | 4.5 | 93.1 | 19.8 |
| Democracy | 1,170 | 1.2 | -10.0 | 10.0 | 6.1 |
| Rights and liberties | 1,219 | 4.1 | 1.0 | 7.0 | 1.6 |
| Economic freedom | 855 | 5.7 | 2.9 | 8.0 | 0.9 |
| CPI | 495 | 3.4 | 0.4 | 10.0 | 1.8 |
| Health expenditure | 764 | 1.7 | 0.0 | 5.1 | 1.0 |
| Immunization | 1,230 | 74.4 | 10.0 | 99.0 | 21.9 |
| US aid | 1,200 | 9,696,315 | 0 | 411,000,000 | 17,700,000 |
| Multilateral aid | 1,231 | 16,300,000 | 0 | 352,000,000 | 41,200,000 |
| Exports | 1,200 | 2,190,000,000 | 890,000 | 140,000,000,000 | 11,500,000,000 |
| Political integration | 1,255 | 55 | 2 | 93 | 20 |
| Social integration | 1,244 | 30.41 | 2.83 | 70.24 | 14.30 |
| Own colony | 1,256 | 1 | 0 | 43 | 5 |
| Other colony | 1,256 | 26 | 0 | 81 | 28 |
| Distance | 1,256 | 9,411 | 2,016 | 16,371 | 3,546 |
| Aid | 1,256 | 9,263,995 | 0 | 411,000,000 | 17,400,000 |

Please note: 1. For expositional reasons, the tables list unlogged values only. 2. Std. Dev. = Standard deviation.

## C.3. Allocation decisions of like-minded donors

| Canada | | | | | |
|---|---|---|---|---|---|
| Variable | Obs. | Mean | Minimum | Maximum | Std. Dev. |
| Health aid° | 630 | 996,639 | 218 | 26,300,000 | 2,201,104 |
| Population | 630 | 70,400,000 | 19,350 | 1,300,000,000 | 214,000,000 |
| GDPpc | 608 | 1,224 | 85 | 9,808 | 1,503 |
| Under-five mortality | 626 | 86.1 | 6.0 | 268.2 | 58.1 |
| Maternal mortality | 624 | 4.3 | 0.1 | 19.9 | 3.6 |
| HIV prevalence | 455 | 3.4 | 0.0 | 28.8 | 5.8 |
| HDI | 533 | 53.7 | 11.1 | 93.1 | 18.8 |
| Democracy | 592 | 1.6 | -10.0 | 10.0 | 6.2 |
| Rights and liberties | 614 | 3.9 | 1.0 | 7.0 | 1.7 |
| Economic freedom | 502 | 5.7 | 2.3 | 8.0 | 0.9 |
| CPI | 309 | 3.5 | 0.4 | 10.0 | 1.8 |
| Health expenditure | 394 | 1.8 | 0.0 | 5.5 | 1.1 |
| Immunization | 622 | 75.3 | 13.0 | 99.0 | 20.3 |
| US aid | 563 | 11,700,000 | 0 | 104,000,000 | 15,800,000 |
| Multilateral aid | 628 | 21,700,000 | 0 | 352,000,000 | 46,900,000 |
| Exports | 610 | 208,000,000 | 0 | 8,700,000,000 | 837,000,000 |
| Political integration | 628 | 60 | 8 | 94 | 19 |
| Social integration | 628 | 30.51 | 2.83 | 66.61 | 14.15 |
| Own colony | 630 | 0 | 0 | 0 | 0 |
| Other colony | 630 | 28 | 0 | 81 | 28 |
| Distance | 630 | 9,137 | 2,556 | 15,655 | 3,380 |
| Aid | 630 | 776,625 | 0 | 23,300,000 | 1,851,976 |

| Denmark | | | | | |
|---|---|---|---|---|---|
| Variable | Obs. | Mean | Minimum | Maximum | Std. Dev. |
| Health aid° | 479 | 1,986,591 | 31 | 23,900,000 | 3,778,919 |
| Population | 479 | 70,800,000 | 510,557 | 1,300,000,000 | 210,000,000 |
| GDPpc | 466 | 661 | 102 | 5,178 | 756 |
| Under-five mortality | 479 | 108.2 | 11.2 | 273.2 | 59.2 |
| Maternal mortality | 479 | 5.3 | 0.1 | 20.7 | 4.1 |
| HIV prevalence | 369 | 4.1 | 0.0 | 28.9 | 6.2 |
| HDI | 434 | 45.0 | 4.8 | 88.9 | 18.2 |
| Democracy | 469 | 0.9 | -10.0 | 10.0 | 6.3 |
| Rights and liberties | 473 | 3.8 | 1.0 | 6.5 | 1.5 |
| Economic freedom | 344 | 5.5 | 2.3 | 7.2 | 1.0 |
| CPI | 180 | 3.2 | 0.4 | 9.0 | 1.5 |
| Health expenditure | 283 | 1.7 | 0.0 | 4.6 | 1.0 |
| Immunization | 473 | 73.6 | 6.0 | 99.0 | 19.9 |
| US aid | 458 | 13,900,000 | 0 | 411,000,000 | 24,900,000 |
| Multilateral aid | 479 | 19,800,000 | 0 | 352,000,000 | 48,200,000 |
| Exports | 405 | 43,300,000 | 0 | 1,890,000,000 | 139,000,000 |
| Political integration | 479 | 56 | 8 | 92 | 19 |
| Social integration | 479 | 24.92 | 5.13 | 60.28 | 11.15 |
| Own colony | 479 | 0 | 0 | 0 | 0 |
| Other colony | 479 | 32 | 0 | 75 | 28 |
| Distance | 479 | 7,001 | 1,651 | 11,104 | 2,059 |
| Aid | 479 | 1,796,342 | -66,234 | 23,900,000 | 3,649,478 |

| Netherlands | | | | | |
|---|---|---|---|---|---|
| Variable | Obs. | Mean | Minimum | Maximum | Std. Dev. |
| Health aid° | 864 | 1,806,411 | 107 | 28,900,000 | 3,341,069 |
| Population | 864 | 51,500,000 | 40,130 | 1,270,000,000 | 162,000,000 |
| GDPpc | 822 | 1,001 | 69 | 9,128 | 1,250 |
| Under-five mortality | 858 | 97.4 | 7.2 | 301.5 | 64.2 |
| Maternal mortality | 858 | 4.4 | 0.1 | 20.0 | 3.8 |
| HIV prevalence | 635 | 3.3 | 0.0 | 28.9 | 5.9 |
| HDI | 772 | 50.2 | 6.4 | 91.6 | 20.2 |
| Democracy | 804 | 1.2 | -10.0 | 10.0 | 6.0 |
| Rights and liberties | 840 | 3.7 | 1.0 | 7.0 | 1.6 |
| Economic freedom | 577 | 5.5 | 2.3 | 7.5 | 1.0 |
| CPI | 298 | 3.4 | 0.4 | 10.0 | 1.7 |
| Health expenditure | 515 | 1.7 | 0.0 | 4.7 | 0.9 |
| Immunization | 846 | 73.1 | 6.0 | 99.0 | 22.0 |
| US aid | 832 | 8,848,782 | 0 | 86,000,000 | 13,400,000 |
| Multilateral aid | 862 | 14,800,000 | 0 | 352,000,000 | 38,500,000 |
| Exports | 681 | 121,000,000 | 100,000 | 2,380,000,000 | 243,000,000 |
| Political integration | 864 | 55 | 3 | 93 | 19 |
| Social integration | 859 | 28.11 | 4.11 | 70.78 | 13.99 |
| Own colony | 864 | 2 | 0 | 62 | 11 |
| Other colony | 864 | 27 | 0 | 75 | 28 |
| Distance | 864 | 6,639 | 1,085 | 16,184 | 2,473 |
| Aid | 864 | 1,615,534 | 0 | 27,700,000 | 3,091,809 |

| Norway | | | | | |
|---|---|---|---|---|---|
| Variable | Obs. | Mean | Minimum | Maximum | Std. Dev. |
| Health aid° | 824 | 1,070,412 | 698 | 19,800,000 | 2,201,041 |
| Population | 824 | 64,700,000 | 508,695 | 1,300,000,000 | 201,000,000 |
| GDPpc | 790 | 1,116 | 85 | 10,003 | 1,365 |
| Under-five mortality | 824 | 91.2 | 5.5 | 268.2 | 57.3 |
| Maternal mortality | 824 | 4.7 | 0.1 | 20.0 | 3.9 |
| HIV prevalence | 633 | 4.2 | 0.0 | 28.9 | 6.7 |
| HDI | 737 | 52.2 | 6.6 | 89.3 | 17.6 |
| Democracy | 778 | 1.6 | -10.0 | 10.0 | 6.1 |
| Rights and liberties | 800 | 3.9 | 1.0 | 6.5 | 1.6 |
| Economic freedom | 572 | 5.7 | 2.3 | 7.5 | 1.0 |
| CPI | 389 | 3.5 | 0.4 | 10.0 | 1.9 |
| Health expenditure | 583 | 1.8 | 0.0 | 5.1 | 1.0 |
| Immunization | 811 | 73.7 | 12.0 | 99.0 | 21.2 |
| US aid | 796 | 10,400,000 | 0 | 411,000,000 | 20,300,000 |
| Multilateral aid | 824 | 19,900,000 | 0 | 352,000,000 | 43,800,000 |
| Exports | 609 | 25,700,000 | 0 | 1,660,000,000 | 120,000,000 |
| Political integration | 824 | 56 | 8 | 92 | 19 |
| Social integration | 820 | 29.30 | 5.13 | 71.66 | 13.94 |
| Own colony | 824 | 0 | 0 | 0 | 0 |
| Other colony | 824 | 29 | 0 | 75 | 28 |
| Distance | 824 | 7,345 | 1,609 | 12,747 | 2,325 |
| Aid | 824 | 936,441 | 0 | 19,800,000 | 2,052,453 |

| Sweden | | | | | |
|---|---|---|---|---|---|
| Variable | Obs. | Mean | Minimum | Maximum | Std. Dev. |
| Health aid° | 577 | 2,236,033 | 235 | 32,000,000 | 3,879,800 |
| Population | 577 | 76,500,000 | 860,755 | 1,300,000,000 | 232,000,000 |
| GDPpc | 550 | 1,227 | 78 | 7,501 | 1,342 |
| Under-five mortality | 577 | 84.3 | 5.5 | 245.8 | 60.8 |
| Maternal mortality | 577 | 4.1 | 0.1 | 20.0 | 3.8 |
| HIV prevalence | 406 | 4.6 | 0.0 | 28.9 | 7.2 |
| HDI | 507 | 53.7 | 6.9 | 93.1 | 19.3 |
| Democracy | 537 | 1.7 | -9.0 | 10.0 | 6.2 |
| Rights and liberties | 551 | 3.9 | 1.0 | 7.0 | 1.7 |
| Economic freedom | 406 | 5.7 | 2.3 | 8.0 | 1.1 |
| CPI | 283 | 3.3 | 0.4 | 9.0 | 1.6 |
| Health expenditure | 331 | 1.8 | 0.0 | 5.1 | 1.1 |
| Immunization | 558 | 76.7 | 13.0 | 99.0 | 20.4 |
| US aid | 539 | 11,800,000 | 0 | 411,000,000 | 23,500,000 |
| Multilateral aid | 577 | 20,300,000 | 0 | 352,000,000 | 46,600,000 |
| Exports | 405 | 138,000,000 | 0 | 3,940,000,000 | 445,000,000 |
| Political integration | 577 | 57 | 8 | 93 | 19 |
| Social integration | 577 | 30.84 | 5.20 | 75.01 | 14.93 |
| Own colony | 577 | 0 | 0 | 0 | 0 |
| Other colony | 577 | 26 | 0 | 75 | 29 |
| Distance | 577 | 7,216 | 838 | 13,104 | 2,672 |
| Aid | 577 | 1,918,089 | -42,900 | 32,000,000 | 3,715,070 |

Please note: 1. For expositional reasons, the tables list unlogged values only. 2. Std. Dev. = Standard deviation. 3. Remember that the individual analysis of allocation decisions focuses on major and like-minded donors as the most important ones.

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# Zusammenfassung

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*Einleitung*

Die Mitgliedstaaten der Vereinten Nationen haben sich im September 2000 auf acht Entwicklungsziele verständigt, deren Absicht die Halbierung der weltweiten Armut bis 2015 ist. Seitdem stehen die Senkung von Kindersterblichkeit, die Verbesserung der Müttergesundheit und der Kampf gegen HIV/Aids, Malaria und andere Krankheiten als wichtige Ziele auf der internationalen Agenda. Das Thema Gesundheit hat in den letzten zwei Jahrzehnten zunehmend an Bedeutung gewonnen, teilweise sichtbar in der Vervierfachung der Gesundheitsentwicklungshilfe in diesem Zeitraum auf 21,8 Mrd. US-Dollar in 2007 (IHME (2009)). In der jüngeren Vergangenheit sind beispiellose Summen für Entwicklungshilfe im Allgemeinen und für Gesundheitsfragen im Speziellen zur Verfügung gestellt worden, teilweise begründet durch die gestiegene Verbreitung der HIV/Aids Epidemie in sub-Sahara Afrika. Der Anteil von Entwicklungshilfe für den sozialen Sektor ist beispielsweise von 20% in den frühen 1990er Jahren auf 35% Mitte des letzten Jahrzehnts angestiegen (Thiele et al. (2007), 600). In den letzten zwei Jahrzehnten sind aber nicht nur die zur Verfügung stehenden Ressourcen substantiell gewachsen, sondern auch die Bandbreite der Ziele für Entwicklungshilfe im Gesundheitswesen hat sich vergrößert. Diese Entwicklungen legen nahe, dass die Bedeutung von und das Interesse an Gesundheitsfragen in Entwicklungsländern zumindest für die traditionelle westliche Gebergemeinschaft gestiegen ist.

Jedes Jahr werden bedeutende Summen an Gesundheitsentwicklungshilfe von entwickelten Ländern an weniger entwickelte Länder transferiert, die klassischerweise von Intermediären als verbindendem Element zwischen Geber und Empfänger weitergeleitet werden. Intermediäre für Gesundheitsentwicklungshilfe sind bilaterale und multilaterale Organisationen zur Entwicklungszusammenarbeit, private Stiftungen, Public-Private-Partnerschaften und internationale Nichtregierungsorganisationen. Der erste Teil der Dissertation ist den Interaktionen zwischen Geber und Intermediär, als Spiel modelliert, gewidmet. Das **erste Ziel** der Arbeit ist, die Kräfte, die den Interaktionen zwischen den vielen verschiedenen Gebern und Intermediären innewohnen, zu identifizieren und zu verstehen.

Intermediäre verkünden in der Regel öffentlich, welche offiziellen Ziele erreicht werden sollen, während die Auswahl- und Budgetregeln oft unbekannt oder sogar widersprüchlich sind. Die Evidenz zur Allokation von Entwicklungshilfe lässt erkennen, dass viele Determinanten den Entscheidungsprozess beeinflussen und dass diese Motive zwischen Intermediären und über die Zeit variieren. Die moderne Herangehensweise der empirischen Forschung zur Entwicklungshilfe gründet auf der Annahme, dass politische, ökonomische, humanitäre und strategische Motive den Entscheidungsprozesses für Entwicklungshilfe bestimmen. Bilaterale Organisationen der Entwicklungszusammenarbeit sind die finanziell stärksten und deswegen wichtigsten Intermediäre für

Gesundheitsentwicklungshilfe. Grundsatzerklärungen vieler Geber und Intermediäre betonen die Bedeutung globaler Gesundheitsprobleme. Vor diesem Hintergrund ist die **zentrale Frage** dieser Arbeit, inwieweit das Wissen um schlechte Gesundheitsverhältnisse in einem möglichen Empfängerland die Entscheidungen von bilateralen Intermediären im Rahmen von Gesundheitsentwicklungshilfe beeinflusst. Eine sekundäre Frage ist, inwiefern andere Motive die Wahl eines Empfängerlandes oder die Allokation von Ressourcen beeinflussen. Eine weitere Frage ist, ob sich die Selektivität im Hinblick auf die entsprechenden Gesundheitsindikatoren nach der Festlegung der Millenniums-Entwicklungsziele vergrößert hat.

Im zweiten Teil der Arbeit konzentriert sich die empirische Analyse auf den Entscheidungsprozess der Intermediäre für Gesundheitsentwicklungshilfe. In der Forschung ist dies bislang der erste Versuch, die Bedeutung von Gesundheitsindikatoren für die Auswahl eines Landes als Empfänger von bzw. die Allokation von Gesundheitsentwicklungshilfe an ein ausgewähltes Land zu analysieren. In diesem Bereich gibt es bisher keine empirische Evidenz zu den Beweggründen der Geber weder für die Auswahl noch die Allokation. Die Unterscheidung zwischen den Determinanten der Selektions- und der Allokationsentscheidung ist jedoch notwendig, um die separate Analyse der beiden entscheidenden Schritte des Entscheidungsprozesses zu ermöglichen. Hinzukommt, dass die ausschließliche Analyse des zweiten Schrittes, der Allokationsentscheidung, aus ökonometrischer Sicht impliziert, dass die Determinanten beider Entscheidungen dieselben sind. Die geringe, zur Verfügung stehende, Evidenz zu den Unterschieden zwischen Selektion und Allokation in Bezug auf Entwicklungshilfe im Allgemeinen legt allerdings nahe, dass die Motive jeweils andere sein könnten. Der **zweite Schwerpunkt** der Dissertation liegt darin, herauszufinden, welche Faktoren die Selektionsentscheidung der durchschnittlichen bilateralen Organisation der Entwicklungszusammenarbeit, aber auch die von individuellen bilateralen Organisationen, entscheidend beeinflussen.[140] Die **dritte bedeutende Frage** ist, welche Faktoren die Auswahlentscheidung der durchschnittlichen bilateralen Organisation, aber auch ausgewählter individueller bilateraler Organisationen, beeinflussen. Dyadische Daten über den Transfer von Gesundheitsentwicklungshilfe von maximal 22 Gebern an maximal 160 Empfänger zwischen 1990 und 2007 wurden genutzt, um diese Fragen zu beantworten. Der Datensatz vom *Institute for Health Metrics and Evaluation* basiert auf den offiziellen Statistiken der Entwicklungshilfe für den Gesundheitsbereich, die vom Ausschuss für Entwicklungshilfe (DAC) der Organisation für wirtschaftliche Zusammenarbeit und Entwicklung (OECD) zur Verfügung gestellt werden. Insgesamt dient die Neue Institutionenökonomik als theoretisches Rahmenwerk, in das die Analysen sowohl der Interaktion zwischen Geber und Intermediär als auch des Entscheidungsprozesses der Intermediäre für Gesundheitsentwicklungshilfe eingebettet sind.

[140] Im Folgenden werden bilaterale Organisationen der Entwicklungszusammenarbeit als bilaterale Geber bezeichnet. Zum Einen, weil das in der Tradition der existierenden Literatur zu Entwicklungshilfe steht und Vergleiche der empirischen Ergebnisse mit vorherigen Studien erleichtert. Zum Anderen ist es schwierig, eine klare Trennlinie zwischen nationaler Regierung und bilateraler Entwicklungsorganisation als Intermediär zu ziehen, zumindest in Bezug auf länderübergreifende Analysen.

### *Die Geber-Intermediär-Interaktion modelliert in drei Spielen*

Die Allokationsentscheidung, als sichtbarer Teil des Entscheidungsprozesses für Entwicklungshilfe, ist in Form von drei sequentiellen Spielen mit zwei Spielern, einem Geber und einem Intermediär, modelliert. Die Abstraktion von den Komplexitäten des Ressourcentransfers in der Realität ermöglicht, die individuellen Beweggründe, die Anreize für die strategischen Entscheidungen der Spieler und die Konsequenzen des jeweiligen Verhaltens in einem allgemeinen Model zu isolieren. Der Geber spielt immer als Erstes in dieser klassischen Prinzipal-Agent-Interaktion mit imperfekter Information; folglich muss der Geber der Reputation des Intermediäres ausreichend vertrauen, um überhaupt erst Ressourcen zur Verfügung zu stellen. Der Geber maximiert seinen Nutzen durch das Spenden in der Erwartung des größtmöglichen positiven Effekts, während der Intermediär seine Finanzierung maximiert, um das Fortbestehen der Organisation zu gewährleisten.

Die drei sequentiellen Spiele modellieren die Interaktion zwischen Geber und Intermediär unter wechselnden Bedingungen. Die Spielstruktur betont dabei die Interdependenzen zwischen asymmetrischer Information, Vertrauen, Institutionen und Reputation. Der Reputationsmechanismus hat in jeder Situation einen anderen Effekt. Die Analyse zeigt, dass die Bedeutung der Reputation als Feedbackmechanismus für den Geber über das Verhalten des Intermediäres von der institutionellen Umgebung und der relativen Macht jedes Spielers abhängt. Im ersten Spiel ist der Geber in einer Zwickmühle und somit gefangen, weil er keine anderen attraktiven Optionen hat. Der Intermediär hat einen quasi-monopolistischen Status und der Reputationsmechanismus spielt keine Rolle. Im zweiten Spiel kann der Geber dem Intermediär glaubwürdig mit einem finanziellen Einschnitt drohen; nämlich, die Beziehung zum Intermediär zu beenden. Solange der Geber jedoch von der Glaubwürdigkeit des Intermediäres überzeugt ist, wird er den Intermediär nicht verlassen. Das Spiel illustriert die Interaktion in einem Polypol, in dem der Reputationsmechanismus funktionieren kann. Im dritten Spiel ist der Geber in der Lage, den Intermediär zu überwachen und dadurch für diesen einen Anreiz zu schaffen, sich auf die Präferenzen des Gebers zu konzentrieren. Der Geber hat eine quasi-monopolistische Stellung in dieser Interaktionssituation, Reputation dient hier als direkter Feedbackmechanismus.

Die Modellierung der Interaktion zwischen Geber und Intermediär als Spiel ermöglicht einen genaueren Blick auf die bisweilen dysfunktionale Feedbackverbindung zwischen Empfänger und Geber. Die Spiele erlauben, die Rolle von Reputation zu beleuchten, wie der Mechanismus mit Institutionen zusammenhängt und unter welchen Bedingungen er wahrscheinlich funktioniert. Die Spiele unterstreichen auch die Notwendigkeit von Dritten als externe Informationsquelle, damit Reputation ein effektiver Feedbackmechanismus sein kann. In ihrer Einfachheit können die modellierten Interaktionen auf alle eingangs erwähnten Typen von Intermediären angewendet werden, die relevant sind für Gesundheitsentwicklungshilfe.

## *Der Entscheidungsprozess*

### *a) Selektion*

Eine Panel Logit Analyse bzw. Panel Probit Analyse untersucht die Bedeutung von Gesundheits- und Entwicklungsindikatoren, die Qualität der institutionellen Landschaft im Empfängerland, die Anstrengungen des Empfängers des nationalen Gesundheitssystems und die relationalen Bindungen zwischen Geber und Empfänger für die Selektionsentscheidung in Bezug auf Gesundheitsentwicklungshilfe. In der aggregierten Analyse wird außerdem die Bedeutung strategischer Interaktionen unter Gebern für das Selektionsverhalten des (hypothetischen) Durchschnittsgebers beleuchtet. Insgesamt testen zehn Hypothesen die potentiellen Determinanten der Auswahlentscheidung.

Die Ergebnisse der aggregierten Analyse zeigen, dass hohe Kindersterblichkeit und eine hohe HIV Verbreitungsrate die Auswahlwahrscheinlichkeit erhöhen. Müttersterblichkeit hat jedoch einen inkonsistenten Effekt auf die Auswahlentscheidung, für ein gegebenes Niveau an Kindersterblichkeit und HIV Verbreitung. Die Resultate der desaggregierten Analyse des individuellen Geberverhaltens zeigen, dass nur die HIV Verbreitungsrate die Auswahlwahrscheinlichkeit konsistent erhöht. Die Qualität der institutionellen Umgebung ist nur von geringer Bedeutung für die durchschnittliche Auswahlentscheidung. Nur ökonomische Freiheit hat einen konsistenten positiven Effekt auf die Wahrscheinlichkeit, ausgewählt zu werden, während das Korruptionsniveau, die allgemeinen Rechte und Freiheiten oder die Effektivität der Empfängerregierung keine Rolle spielen. Die verfügbare Evidenz zum individuellen Geberverhalten zeigt jedoch, dass die Signifikanz und die Größe der Proxies für institutionelle Qualität für individuelle bilaterale Geber bzw. für Gruppen bilateraler Geber variieren. Investitionen in das öffentliche Gesundheitswesen von Seiten des Empfängers haben einen unterschiedlichen Effekt für die Auswahlwahrscheinlichkeit durch den Durchschnittsgeber und individuelle Geber. Einerseits sind Impfraten und öffentliche Gesundheitsausgaben nicht signifikant für die durchschnittliche Selektionsentscheidung. Andererseits beeinflussen Impfraten die Auswahl durch individuelle Geber, wenn auch nicht substantiell. Einige bilaterale Geber präferieren Empfänger mit hohen Gesundheitsausgaben, während andere bevorzugt Empfänger mit einem niedrigen Ausgabenniveau auswählen. Ökonomische, kulturelle und historische Verbindungen beeinflussen die durchschnittliche Auswahlentscheidung, während ökonomische, historische und geographische Konnexes hauptsächlich die Selektion der individuellen Geber bestimmen. Für die großen Geber sind für die Empfängerauswahl besonders bilaterale Beziehungen entscheidend. Diese sind weniger wichtig für kleine Geber und praktisch unbedeutend für gleichgesinnte Geber. Die relative Wichtigkeit des Gebers ist für die durchschnittliche Selektionsentscheidung bedeutend. Die Auswahlentscheidung der USA, als wichtigstem Geber, ist von besonderer Bedeutung für die durchschnittliche Auswahlentscheidung im Hinblick auf bevölkerungsreiche Empfängerländer.

*b) Allokation*

Die Analyse der Allokationsentscheidungen ist weiterführender als bisherige Untersuchungen, weil, erstens, in der aggregierten Analyse der durchschnittlichen bilateralen Allokationsentscheidung vielfältige Hypothesen getestet werden und, zweitens, die desaggregierte Analyse des individuellen Geberverhaltens eine sektorspezifische Analyse des zweistufigen Entscheidungsprozesses für Gesundheitsentwicklungshilfe ermöglicht.

Eine *Lognormal Hurdle Model* Analyse untersucht die Bedeutung von Gesundheits- und Entwicklungsindikatoren, die Qualität der institutionellen Landschaft im Empfängerland, die Anstrengungen des Empfängers hinsichtlich des nationalen Gesundheitssystems, Wettbewerb unter Gebern und die relationalen Bindungen zwischen Geber und Empfänger für die Allokation von Gesundheitsentwicklungshilfe. Außerdem wird die Bedeutung der programmatischen Präferenzen des Gebers in der aggregierten Analyse des durchschnittlichen Allokationsverhaltens getestet. Insgesamt werden in elf Hypothesen die potentiellen Determinanten der Allokationsentscheidung untersucht.

Die Untersuchung der Bedeutung von Gesundheitsindikatoren für den Allokationsprozess von Gesundheitsentwicklungshilfe ergibt das folgende Bild. Müttersterblichkeit und Verbreitung von HIV erhöhen die Attraktivität eines Empfängerlandes für den Durchschnittsgeber, aber Kindersterblichkeit hat keine Bedeutung für die durchschnittliche Allokationsentscheidung. Werden jedoch speziell die letzten Jahre betrachtet, so sind alle Gesundheitsindikatoren maßgeblich für die Allokation von Gesundheitsentwicklungshilfe. Nichtsdestotrotz hat die HIV Verbreitungsrate den konsistentesten und substantiellsten Effekt für die durchschnittliche Allokationsentscheidung. Im Hinblick auf den individuellen Entscheidungsprozess erhöhen schlechte Gesundheitsindikatoren die Allokation von Ressourcen, aber auch hier ist die HIV Verbreitung der Gesundheitsindikator mit dem konsistentesten Effekt. Keiner der Gesundheitsindikatoren ist interessanterweise wirklich relevant für die Allokationsentscheidungen individueller Geber; entgegen allgemeiner Vermutungen orientieren sich gleichgesinnte Geber in ihrem Entscheidungsprozess nicht stärker an Gesundheitsindikatoren als große Geber.

Die Qualität der institutionellen Umgebung ist sowohl wichtig für die durchschnittliche Allokationsentscheidung als auch für die Entscheidungen vieler individueller bilateraler Geber. Der Durchschnittsgeber alloziert, ceteris paribus, mehr Gesundheitsentwicklungshilfe an Empfänger mit größerer ökonomischer Freiheit und geringerem Korruptionsniveau, aber auch an Empfänger mit weniger allgemeinen Rechten und Freiheiten. Das legt nahe, dass sich der Durchschnittsgeber scheinbar der potentiellen Probleme mit Korruption bewusst ist und größeren Wert auf ökonomische Freiheiten legt, während Länder mit geringerer allgemeiner Freiheit mehr Gesundheitsentwicklungshilfe erhalten. Eine mögliche Interpretation ist, dass der Durchschnittsgeber versucht, eine schlechte Regierung zu kompensieren. Die Indikatoren der institutionellen Qualität haben jedoch keinen sichtbaren Einfluss auf die Entscheidungen einzelner bilateraler Geber. Öffentliche Ausgaben für das Gesundheitswesen haben weder einen systematischen Effekt auf die

Allokationsentscheidung des durchschnittlichen Gebers noch einzelner bilateraler Geber. Während strategische Interaktionen die Allokationsentscheidung des Durchschnittsgebers mit relativ großem Budget an Gesundheitsentwicklungshilfe beeinflussen, sind sie unbedeutend für die meisten bilateralen Geber. Bilaterale Beziehungen, insbesondere ökonomische, kulturelle und historische Beziehungen, beeinflussen das durchschnittliche Allokationsverhalten entscheidend. Auch individuelle Geber werden in ihrem Entscheidungsprozess stark von Geber-Empfänger-Beziehungen bestimmt. Charakteristiken der Geberländer haben einen Einfluss auf die durchschnittliche Allokationsentscheidung. Die Präferenz des Gebers für Gesundheitsangelegenheiten hinsichtlich der eigenen nationalen politischen Agenda scheint sich in höheren Allokationen für Gesundheitsentwicklungshilfe niederzuschlagen. Ein höheres Korruptionsniveau im Geberland hingegen verringert die Allokationen. Belastbare Schlussfolgerungen sind hier jedoch schwierig aufgrund der beschränkten Verfügbarkeit von Daten. Kontrolliert man für das Pro-Kopf-Einkommen der Geberländer, so stellen Geber mit einer größeren gesellschaftlichen Ungleichheit konsistent mehr Entwicklungshilfe zur Verfügung.

*c) Selektion und Allokation*

Die aggregierten und desaggregierten Analysen des Entscheidungsprozesses von Intermediären für Gesundheitsentwicklungshilfe unterstreichen, wie wichtig die Unterscheidung zwischen Selektions- und Allokationsentscheidung ist. Mit Fokus auf die bilateralen Organisationen der Entwicklungszusammenarbeit als wichtigster Gruppe der Intermediäre zeigen die Analysen, dass, erstens, Kindersterblichkeit und die Verbreitungsrate von HIV zu einer höheren Auswahlwahrscheinlichkeit durch den Durchschnittsgeber führen. Zweitens, lediglich die HIV Verbreitung erhöht konsistent die Selektionswahrscheinlichkeit durch individuell bilaterale Geber. Drittens, Müttersterblichkeit und HIV Verbreitung erhöhen die Allokation von Gesundheitsentwicklungshilfe durch den Durchschnittsgeber. Viertens, alle drei Gesundheitsindikatoren sind in den letzten Jahren für den Entscheidungsprozess immer wichtiger geworden. Fünftens, die Allokationsentscheidungen von großen Gebern und gleichgesinnten Gebern, den zwei wichtigsten Gruppen innerhalb der bilateralen Geber, gründen sich nicht auf Gesundheitsindikatoren, allerdings mit geringfügigen Ausnahmen.

Zusammengefasst ist die HIV Verbreitungsrate der Gesundheitsindikator mit dem konsistentesten Effekt auf die Selektionsentscheidung sowohl des Durchschnittsgebers als auch einzelner bilateraler Geber. Die Allokationsentscheidung großer Geber und gleichgesinnter Geber orientiert sich jedoch nicht an Gesundheitsindikatoren. Allerdings zeigen die Ergebnisse, dass sich das Verhalten des Durchschnittsgebers zunehmend an Gesundheitsindikatoren orientiert hat in den letzten Jahren, mit HIV Verbreitung als dem entscheidenden und Kindersterblichkeit als dem unwichtigsten Indikator.

Diese Ergebnisse führen zu den folgenden Schlussfolgerungen: Erstens, Gesundheitsindikatoren haben einen unterschiedlichen Effekt für die Selektion und die Allokation, was ein starkes Argument

für die Differenzierung zwischen beiden Entscheidungsstufen darstellt. Zweitens, Gesundheitsindikatoren sind zu den treibenden Kräften für die Allokationsentscheidung geworden, zumindest hinsichtlich des durchschnittlichen Geberverhaltens. Es scheint, dass die drei international festgelegten Gesundheitsziele eine Veränderung in der Allokationspolitik hervorgerufen haben. Trotz des gesteigerten Interesses an Gesundheit muss aber auch erwähnt werden, dass, drittens, die HIV Verbreitungsrate der Indikator mit dem konsistentesten und relativ größten Effekt ist. HIV/Aids scheint das globale Gesundheitsproblem zu sein, dass die Aufmerksamkeit der traditionellen Gebergemeinschaft auf sich zieht, wenn auch für Kinder- und Müttersterblichkeit kontrolliert wird. Einerseits bedeutet dieses Ergebnis, dass die HIV Verbreitungsrate der einzige Gesundheitsindikator ist, dessen Rolle im Entscheidungsprozess eindeutig identifiziert ist, aber nicht, dass es wirklich der einzige Gesundheitsindikator ist, der eine Rolle spielt. Andererseits, angesichts der eindeutigen und konsistenten Rolle von HIV/Aids, könnte man annehmen, dass das größere Interesse der westlichen Medien an der HIV/Aids Pandemie zu einem Verdrängungseffekt geführt hat. Viertens, die verfügbare Evidenz beendet den Mythos, dass sich gleichgesinnte Geber in ihren Entscheidungen stärker oder exklusiver an den Bedürfnissen des Empfängers orientieren. Fünftens, selbst sektorspezifische Hilfe wie Gesundheitsentwicklungshilfe unterliegt vielen anderen Faktoren, die aus Charakteristiken des Gebers, aus Charakteristiken des Empfängers, aber auch aus den bilateralen Beziehungen zwischen Geber und Empfänger resultieren.

Abschließend betrachtet, zeigen die Ergebnisse, dass die Gesundheitsindikatoren die Selektions- und die Allokationsentscheidung beeinflussen, aber in unterschiedlichem Ausmaß. Die Entwicklungshilfepolitik der Geber ist, trotz gemeinsam festgelegter Gesundheitsziele, heterogen. Viele Motive, einschließlich politischer und ökonomischer Faktoren, beeinflussen die Auswahl- und Allokationspolitik des Durchschnittsgebers, aber auch die Mehrzahl der bilateralen Geber, obwohl Gesundheitsentwicklungshilfe speziell für den Sektor Gesundheit gedacht ist. Zusammenfassend kann man sagen, dass der Entscheidungsprozess für Gesundheitsentwicklungshilfe des Durchschnittsgebers und der einzelnen bilateralen Geber mehrdimensional ist und keinem strikten Fokus auf die Bedürftigkeit des Empfängers, ausgedrückt in schlechten Gesundheitsindikatoren, folgt.

## *Abschließende Bemerkungen*

Die Millennium-Entwicklungsziele repräsentieren acht Ziele, die im Jahr 2000 von der internationalen Gemeinschaft als Prioritäten für die weltweite Agenda der Entwicklungszusammenarbeit festgelegt wurden. In den nachfolgenden fünfzehn Jahren dienen diese Ziele als Richtschnur, wenn nicht sogar als Norm, im Hinblick auf das Notwendige, was getan werden muss. Die Bedeutung von Gesundheit als Menschenrecht, was im scharfen Widerspruch steht zu den prekären Gesundheitsbedingungen von vielen Menschen auf der ganzen Welt, bestimmt den öffentlichen Diskurs über die Gründe für diese drei Gesundheitsziele. Die Motive, ein Empfängerland auszuwählen, aber auch die Beweggründe,

einen spezifischen Betrag an Gesundheitsentwicklungshilfe zu allozieren, sind im Rahmen dieser Dissertation sorgfältig untersucht und transparent gemacht worden. Das Verständnis für die Beweggründe, die dem Entscheidungsprozess zugrunde liegen, ist eine Grundvoraussetzung, um die Effektivität dieser Zahlungen an Gesundheitsentwicklungshilfe zu beurteilen. Nur Transparenz über die Determinanten der Selektions- und der Allokationsentscheidung für Entwicklungshilfe im Gesundheitswesen ermöglichen eine kritische Beurteilung des Erreichten in der Zukunft.

## Überblick über die zentralen Forschungsfragen